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TRANSACTIONS

OF THE

TWELFTH ANNUAL MEETING

OF THE

AMERICAN LARYNGOLOGICAL ASSOCIATION

HELD IN THE CITY OF BALTIMORE, MD.

MAY 29, 30, AND 31

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TRANSACTIONS

OF THE

TWELFTH ANNUAL MEETING

OF THE

AMERICAN LARYNGOLOGICAL ASSOCIATION,

HELD IN THE CITY OF BALTIMORE, MARYLAND, MAY 29, 30, AND 31, 1890.

ADDRESS OF THE PRESIDENT.

By JOHN N. MACKENZIE, M. D.

Fellow-members of the American Laryngological Association:

In obedience to the established usage of this society, it becomes my pleasant privilege, as your presiding officer, to open the sessions of this its twelfth annual congress, and to offer you the cordial greeting which the Monumental City has ever extended to the stranger within her gates.

In the accomplishment of this mission it is difficult, if not impossible, to be original. The story of welcome has been so often and so eloquently told that he would indeed be rash who ventured any variations on this theme.

Therefore, without oratorical display of words—with the simplest possible language—in the name of your colleagues in this city, in the name of the great university within whose walls we are assembled, and in the name of good-fellowship and hospitality, I welcome you to the freedom of our homes.

This is neither the time nor the place to sing the praises of this association, but I believe that the bounds of propriety are not transgressed when I say that since we last met in convention in the city of Washington you have been ceaseless in your activity, and have added many rich and original pages to the literature of medicine, which are

eloquent demonstrations of the fact that you still maintain the honorable position which has been accorded you by the laryngologists of the world.

During the past year, among our active membership we have, thank God, no death to chronicle; but we have lost, with sorrow, one of the most distinguished of our corresponding fellows, Professor Rudolph Voltolini, of Breslau.

Voltolini was a pioneer in rhinology, and his numerous publications testify to the carefulness of his investigations and the originality of his mind. He will be chiefly remembered by his observations on the relationship between nasal disease and asthma, and by his works on the galvano-cautery and electrolysis. While he was, historically speaking, not the first to point out the former interesting relationship; while he passed by in silence the many discoveries which you, men of this association, have made in that hitherto unexplored domain—still, in justice to the dead German, it must be said that his solitary observation was at once the source and inspiration of much of the literature on the dependence of asthma on nasal disease, and I, for one, take pleasure in acknowledging his rightful claim.

When, twelve years ago, the conception of creating this society arose in the brain of its too-early-lost founder, it was hardly possible to gather together more than a corporal's guard of men of national reputation in this department of medicine. The deliberations of the little band which met at Buffalo were characterized by great wisdom and foresight, and, among other things, it was judiciously determined to limit the membership to fifty. Now the complexion of things has entirely changed. While at that time the specialist was found only in the larger cities, now there is scarcely a hamlet in the land that does not contain a laryngologist. Indeed, in recent years the laryngologist has, in some quarters at least, proliferated to an alarming extent. It has been said that a wise Providence has ordained that the largest rivers and bays shall be contiguous to the largest towns; so in its dispensations it has perhaps likewise determined that the latter shall be the residences of the most prominent leaders in the ranks of the medical profession. While, then, we can not disregard the operation of this inexorable law of natural selection, it at the same time behooves us to remember that many of the directors of medical thought have lived in the smaller towns. Our doors should therefore be open to all, but at no time and under no circumstances should we be guided in the selection of members by personal, political, or geographical considerations. I plead for the life of this great

principle. It should be made indestructible by statute and so imbedded in the fabric of the Constitution as to render its violation beyond the possibility of peradventure.

There will come a time, then, in the future—in the near future, perhaps—when it will be necessary to extend the boundaries of our membership. The great advances which larnygology has made in the last decade, the daily growing necessity of a knowledge of its special province in the elucidation of obscure affections in adjacent and remote organs of the body, the prominence given it in our universities, colleges, and post-graduate schools; the popularity of its study and the accordingly rapidly increasing number and far-reaching geographical distribution of its votaries, will, in the course of events and in the nature of things, render such action imperative.

Taking everything into consideration and speaking, I believe, in the interest of our society, I am of the opinion that the time for increasing the limits of our membership has not yet arrived.

At this meeting you will be called upon to vote on a motion which contemplates a radical change in the constitution in regard to the method of selecting officers. The reasons for and against this proposition should be thoughtfully weighed, but whichever method you shall see fit to adopt, let it be solely with reference to the principle enunciated above. We should forever have in sight not the advancement of sectional or individual interest, but the honor, welfare, and exalted standard of American laryngology.

Next year we meet as a part of the Congress of American Physicians and Surgeons. The highly scientific character of the proceedings of the first sessions of this congress clearly points to the perpetuity of this triennial confederation of the special societies at the national capital.

Let me urge upon every member the importance of regular annual attendance upon the meetings, if it be within the bounds of possibility. The larger the number, the more certain the thorough ventilation of papers by discussion.

It is often objected that certain subjects which have been brought up from time to time have been exhausted. No subject is ever exhausted; the individual may be, and such a sentiment is therefore rather the lazy confession of exhausted effort than a truthful statement of the case. It has long been my custom, when seeking something new, to turn to the ancients. We can often learn more out of an old subject than out of a new one, provided we approach it in the proper way, and there can therefore be no reason why it should

not be feasible at any or all meetings to present some problem, hackneyed though it may be, for a discussion in which all can join and upon which, I am sure, many will cast new light, even though it be in the direction of the smallest and apparently most trivial things.

One word, in concluding these desultory remarks, concerning our library. The office of librarian is a thankless one, and we are to be congratulated that our present industrious and able librarian, Dr. French, has consented to continue serving in that capacity. I would suggest that each member send, as soon as possible after publication, to the librarian a full list, accompanied, if possible, with one or more copies, of his various contributions to medical literature in chronological order, so that a classified index can be made of *all* the work done by the association, which, it is needless to say, would be invaluable for future reference.

It now only remains for me to again express my grateful appreciation of the distinguished honor you have conferred upon me. When I contemplate the record which this society has made in the few brief years of its existence, when I reflect that the names of many of its members are favorably known all over the civilized world, I can not but feel proud of the trust you have confided to my keeping. I beg that you will deal generously with my inexperience as a presiding officer, and I bid you again welcome to our Southern home!

Paper.

A SUGGESTION CONCERNING THE INTIMATE RELATIONSHIP BETWEEN BULBO-NUCLEAR DISEASE AND CERTAIN OBSCURE NEUROTIC CONDITIONS OF THE UPPER AIR-PASSAGES.

By JOHN NOLAND MACKENZIE, M. D.

THE reciprocal relationship between lesions of the central nervous apparatus and certain morbid phenomena exhibited in the upper respiratory tract is a subject of surpassing interest, and one, strange to say, upon which comparatively little original work has been done. There has been too great a tendency for specialists to confine research within exact anatomical limits and within too contracted a sphere of observation.

The intimate connection between a large number of affections of the upper air-tract and the sympathetic and cerebro-spinal systems of nerves irresistibly obtrudes itself upon the recognition of even the

most superficial observer, and it is therefore all the more remarkable that attention has not been sufficiently drawn in the direction of such an obvious fact. Except in the case of certain paralytic affections, whose pathology is often, but by no means always sufficiently obvious, the subject is either passed by in silence by text-books on laryngology, or dismissed with a page or two of glittering medical generalities which amount simply to a confession of learned ignorance. Words take the place of explanation, and the more they multiply the more vague and indistinct the subject becomes.

There are a host of obscure neurotic phenomena seen in the upper air-tract that suggest themselves at once. Not to multiply examples, take, for instance, the disease known as "functional aphonia," or the affection to which Sir Morell Mackenzie has given the name of "spasm of the tensors of the vocal cords." What do we know concerning the pathology of either one of these affections? The conclusion is resistless that they are in some way connected with central trouble, and yet we know absolutely nothing of their primary causes. We know by empirical clinical experience that the former disease can be cured by the application of electricity within the larynx, or, for that matter, upon any indifferent part of the throat, and that the latter is in the vast majority of cases incurable. However we may delude ourselves and our patients into the belief that in the first case we accomplish a cure by direct stimulation of the laryngeal muscles, regard for absolute truth compels the confession that we do so by a sort of miracle, so to say, of psychic impression; while in the second case we do not cure, because we have no anatomical or pathological basis to go upon.

I have in numerous former publications, which are familiar to most of you and to which I need not therefore refer, endeavored to point out the intimate union between certain obscure respiratory troubles and disorders of the sympathetic nervous system, and have formulated a number of propositions which, I believe, may enable us to approach more nearly the scientific generalization of a host of phenomena whose kinship has never before been sufficiently considered.

While in some quarters I have encountered adverse criticism, and while open always to correction, my subsequent clinical experience encourages the belief that my former conclusions were in the main correct. But while the testimony of our special senses must accord to the sympathetic an important rôle in the pathology of many obscure affections of the upper air-tract, it must not be

forgotten that it is often only one factor in the mechanism of the attack, while in other cases the cerebro-spinal system is the agent most conspicuously concerned. It is this part of the subject that I desire to speak of to-day.

I shall submit these remarks to you simply as a suggestion, and, in order to provoke discussion, will read some notes from a case which came long ago under my observation, not because they contain anything strikingly original, but solely to give those who may follow me in the discussion something tangible upon which to base their remarks:

Mrs. X., aged about forty, consulted me nine years ago with the following history:

She had enjoyed good health up to ten years prior to consultation, when her husband died a drunkard. Prior to and after his death she had had a great deal of domestic trouble. Examination of her family history and that of her husband reveals nothing positive. She has never had syphilis, nor received any injury in any part of the body. Her circumstances have always been good and habits temperate, and she is not naturally inclined to a nervous temperament. For some time prior to her husband's death domestic sorrow had led to much mental excitement.

Shortly after his death, while cleaning her room and apparently in perfect health, her face became suddenly drawn downward and outward to one side (the left). This was especially noticeable about the angle of the mouth. There was no difficulty in articulation and no other symptoms, and the attack passed off in three days under treatment. Following the attack there was an interval of apparent health up to within about a year before she consulted me. She had been washing clothes all day in the yard, and awoke the next morning to find that she had lost power in her right hand. Sensation in the fingers was abolished, so that she could not pick up things nor hold them in her hand. She could grasp the hand of her physician only with difficulty. With this was associated numbness and tingling in the extremities without loss of power, and twitching of one of the tendons in the palm. The tingling sensation extended into the throat and gave rise to considerable malaise. She ascribed this attack to having carried the wet clothes on her arm during the day before. These symptoms lasted about a week, and as they were disappearing she noticed slight difficulty in articulation, causing her to mumble her words. There was no aphasia. This grew worse, and she complained of some oppression in the chest. At the same time she noticed that her mouth was drawn a little to the left side. She took to bed, and in about a week began to improve. Her speech became clear, but she complained of pain in the throat and legs, the latter becoming swollen. All these symptoms disappeared, however, and several weeks after their subsidence, while sweeping her room, she was suddenly seized with a

foaming at the mouth and puffing outward of the cheeks; had no other symptoms except tingling in the right hand. No fall, convulsion, etc. She walked up stairs immediately, but could only mumble out a few unintelligible words. When the violence of the attack had passed off she noticed a weakness of the tongue, with difficulty in its protrusion and difficulty also in articulation. At this time her legs were swollen, and she had tingling sensations in them with formication. The trouble with the tongue grew gradually worse, and about six weeks before seeing me first noticed slight dysphagia, especially in the deglutition of liquids. At the same time she was taken with pain in the back of the neck and shooting pains in the hand. These, together with occasional flushes of heat in the head, passed away. She remained in the above condition until two weeks prior to consultation, when she began to talk through her nose. She has lost flesh lately.

Symptoms on Admission.—Face has a characteristic lacrymose appearance, with a tinge of alarm. The mouth is lengthened and drawn closely across the teeth; its angles are depressed and the naso-labial sulci deepened. The tongue can be protruded, but with difficulty, and she can not lift it to the roof of the mouth, nor can she place it above the upper lip. Its movements are slow and evidently require effort to effect them. It is long, sharp, covered with a foul, white fur, but has no appearance of atrophy, nor are there any fibrillar movements. Its sensation is good and taste is unimpaired. There are small tumors at its tip (fibrillar?). The lips look normal (the patient thinks they are larger than usual). Can blow out a light at a foot from the mouth, but at a greater distance fails to do so. Can not whistle or kiss, but can close and open the mouth perfectly. Attempts at laughing result in a ludicrous expression of the face. The muscles of the mouth and pharynx react but feebly to the faradaic current. Sensibility is intact. There is no paresis or loss of sensibility in the other muscles of the face, head, and eyes. There is some difficulty in mastication, and the patient's laugh degenerates into a grimace.

There is complete paralysis of the soft palate and uvula, and the reflex excitability there and in the pharynx is notably diminished, so that these parts can be irritated without provoking anything but a feeble response. Sensibility and muscular irritability are not impaired. There is some congestion of the parts, but otherwise their appearance is normal. There is no deflection of the uvula.

Rhinoscopic examination of posterior nares and nasal pharynx negative.

The larynx is normal in appearance, but its reflex excitability is much diminished. This is especially noticeable on the epiglottis, whose surface can be irritated without provoking the slightest motion. There never has been the slightest trouble with vocalization, except slight fatigue on exertion. There is great difficulty in expiratory efforts, such as gargling, coughing, etc. She has a small amount of dyspnœa, which

becomes considerable on exertion. The saliva is not increased in quantity, but is thick and tenacious from admixture with the buccal mucus, and has to be withdrawn from the mouth with the finger. The difficulty in expectoration is considerable. During sleep she is often awakened by a sense of suffocation, only relieved by withdrawal of the mucous secretion. During the daytime her handkerchief has to be constantly held to the mouth to catch the abundant secretion.

The patient speaks in a mumbling manner difficult to comprehend, and as though there were some difficulty in closing the glottis, although the excursions of the vocal cords are normal, as seen with the laryngoscope. No aphasia, no confusion of words or syllables.

The right hand and both legs show great muscular weakness. There is pain in the right leg and stiffness and tenderness about the neck.

Temperature normal; pulse regular, 120; respiration 30.

The patient's temperament since her attack has been nervous. Her friends say that without apparent cause she breaks out into spells of noisy weeping, followed by equally unaccountable laughter. Her intelligence is intact, appetite poor, bowels regular.

These observations and the history of the case were taken at her first and only visit, for, receiving an unfavorable prognosis, she never returned, and I am therefore unable to give any further particulars. The above-mentioned data are, however, abundantly sufficient to establish the bulbo-nuclear nature of the trouble. It is unnecessary to comment in detail on this case. It is one with which the neurologist more than the laryngologist has to do, but it is the representative of a class of cases from which both may derive instruction. If specialists in the different departments of medicine would, instead of standing aloof from each other, combine the special knowledge they possess in a common endeavor to elucidate the difficult problems which daily confront us, the hostile cry of ignorant criticism would be forever silenced by their discoveries for the common weal.

Discussion.

Dr. F. H. Bosworth was invited by the Chair to open the discussion. He said: I regard the case as very interesting, but I can not agree with the author that its bulbo-nuclear nature has been clearly established. It seems, on the contrary, that the evidence presented would establish the diagnosis as neuritis and not bulbar disease.

The President: Of what nerve?

Dr. Bosworth: Of the trifacial particularly. This, however, is merely a suggestion. If it is bulbar disease, we should decide what form. Is it a clot? or a thrombus? Is it softening? or a tumor? Bulbar disease is not enough; we should be able to state its nature as well as its place. To my mind the case is not of this kind, but may be a neuritis.

Dr. D. B. DELAVAN: This subject in general is perhaps the most interesting one in the laryngology of to-day, and is certainly the newest and least understood. The fact that eminent diagnosticians disagree, and that they advance ingenious theories of pathology only to have them overthrown by post-mortem investigation, shows that we are only on the threshold of the matter. Ever since Gottstein, following the example of Hughlings Jackson, called attention to the frequency with which laryngeal paralyses of central origin were due to bulbar lesion, there has been observed a tendency to refer all cases with similar symptoms to bulbar disease.

Garel has lately reported two cases in which the laryngeal paralysis was produced, not by bulbar disease, but by a cortical lesion. While it has been fully established that many cases are due to bulbar lesion, it is also possible that the same symptoms may depend upon a central disease of other than bulbar origin.

While it may not be possible to distinguish these cases now, future observation will enable us to determine more accurately the diagnosis between them. A paper, by a well known pathologist, upon the laryngological relations of tabes, or locomotor ataxia, is soon to appear, in which that subject is very thoroughly and philosophically considered, the writer especially dwelling upon the subject of laryngeal crises in tabes. The conjoined study of such cases by laryngologists, neurologists, and pathologists is particularly desirable.

Dr. BOSWORTH: I fail to recall any well-authenticated case of laryngeal paralysis in which the symptoms were due to cortical lesion; any case of central disease where it was shown post mortem that the cause of the paralysis was not in the bulb and was in the brain. In the noted case referred to by Dr. Delavan, the reporter has had reasons submitted to him for making a change in his diagnosis since that case was published. Gottstein's cases attracted attention to this subject, but he did not go much further than Hughlings Jackson, who, from a series of clinical observations, concluded that the source of the paralysis of the laryngeal muscles was in the medulla.

Dr. DELAVAN: In reply to the last remark, physiological experiments upon monkeys, dogs, and cats have clearly shown that a cortical center for the larynx does exist in them; if it is present in the lower animals, as has been conclusively proved, it is proper to assume, by analogy, that such a center also exists in man. Even if it has not yet been fully demonstrated by post-mortem examination, this failure may be owing to faulty methods and imperfect investigation. The center undoubtedly exists. There are cases in which laryngeal paralysis has occurred, and in which no bulbar lesion was found after careful search, where the lesion was evidently in the brain. In the cases I have reported the existence of a bulbar lesion was demonstrated; there are other cases on record where there was no such lesion found, but where, on the other hand, there was distinct lesion of the cortex.

Dr. Bosworth: Psychical centers for the larynx in the cortex I am willing to admit, but not motor.

The President inquired what experiments were referred to as those upon which Jackson's views were based.

Dr. Bosworth: Jackson's views were not based upon experiments, but upon cases. Some years ago, in a paper upon this subject, the speaker discussed this question, and the whole subject was gone over. There are practically but two forms of laryngeal paralysis—abductor paralysis and recurrent laryngeal paralysis.

The President: In closing the discussion, I have only one thing to say. Dr. Bosworth seems to doubt the diagnosis of bulbar disease in the case, and believes it to be one of neuritis of the trifacial nerve. How trifacial neuritis could produce the symptoms recorded I am at a loss to know. Unless the trifacial were distributed to the throat and back of the neck, the œsophagus, tongue, and other organs, the dorsal region and lower extremities, as well as to the face, loss of its function could not produce the phenomena present in the patient. The symptoms as recorded correspond closely with those presented by others as symptomatic of bulbar disease, and I can only conclude that he must have failed to hear the notes of the case as I read them.

Paper.

THE LARYNGOLOGY OF TROUSSEAU AND HORACE GREEN. AN HISTORICAL REVIEW.

By FRANK DONALDSON, M. D.

NEARLY all the prominent and valuable discoveries in science and the arts have reached completion gradually. Thoughtful minds at different epochs have been occupied with attempts to overcome the same difficulties and to solve identical problems. Not aware how near they have been sometimes to success in their attempts, they have often abandoned their work when perseverance would have rewarded them with brilliant results.

We are all familiar with the history of the discovery of the little instrument which has furnished us with a name as well as a science and a practical, invaluable art. Starting from the middle of the last century (1743) with the ingenious device of M. Levret, the laryngoscope had nearly been reached several times by Bozzini, by Senn, and others, but never so nearly as by Babington in 1829. It was left for Garcia, in 1854, to demonstrate in his own person autolaryngoscopy, and to present to the profession his simple mirror

and reflector enabling all to illuminate and inspect the hitherto darkened chambers of the larynx and nares.

The imperfect and unsatisfactory art of laryngology yielded to the exact science of laryngoscopy.

The feat was accomplished. When once the discovery had been made, there was no difficulty in the future.

The history of the invention and of the futile preceding efforts it is unnecessary to mention.

The object of this brief paper is to inquire into that period of the history of laryngology immediately anterior to Garcia's successful inspection of the larynx, and more particularly of the part played by Trousseau, of Paris, and by Horace Green, of New York. The French give great credit to the former, and the American has had his appreciative friends and also his detractors. I thought it might not be uninteresting to endeavor to take an impartial view of both, the writer having had as a student the privilege of following Trousseau in 1850–'51, and of closely watching his practice. All acknowledge that he was a very able clinician. He was particularly interested in the study of diseases of the mouth, oro-pharynx, and larynx —all of which are generally included in the designation of laryngology. His wards contributed abundant material for lectures upon common membranous sore throat, gangrenous and inflammatory pharyngitis, diphtheria, and tubercular laryngitis.

Trousseau popularized the operation of tracheotomy for membranous croup, which he regarded in many cases as diphtheritic. He was very successful. He insisted that the operation should be performed early in the disease, and he used strong solutions of nitrate of silver freely in the orifice after opening the trachea.

His limited knowledge of the pathology of the larynx was that of his day. He taught his classes that tuberculosis and syphilis were the almost exclusive causes of aphonia and dysphonia. For these his treatment was by the application of nitrate of silver in the form of the solid stick to the pharynx, or by solution injected through perforated silver curved tubes passed behind the epiglottis. The shower from these was thrown over the epiglottis and the supraglottis. If it touched any diseased points, it also irritated the healthy surfaces. The oro-pharynx was really the only part that he could illuminate sufficiently to be able to apply the medicaments accurately. The diseases of the upper pharynx and posterior nares he overlooked, for the rhinoscope had not then been applied. These were the points of his practice in 1850 in connection with laryngology.

A set of silver tubes I brought home with me, and used for some years as I had seen him apply them, but I soon ceased to use them, as they were unsatisfactory.

Let us for a moment see what Trousseau did after the laryngoscope had been used by others.

In the last edition of Trousseau's *Clinical Medicine*, published in 1867, edited by M. Michel Peter, his pupil, and translated by Sir John Rose Cormack and Bazire, it is maintained that Trousseau and Belloc, long before the publication of their work on laryngeal phthisis (in 1837), felt that the examination of the larynx by a suitable speculum was a likely means of attaining accurate diagnosis; further, that at the date of their publication they were occupied with the construction of such a speculum laryngis. At that time, likewise, M. Sellique, an ingenious mechanic, who was also a sufferer from laryngeal phthisis, made for his physician an apparatus consisting of two tubes—one for throwing light on the glottis, and the other for affording a view of the image of the glottis, as reflected in a mirror placed at the guttural extremity of the instrument. There were serious defects in this instrument; we are told that the difficulties in applying it were so great that Trousseau ceased to try to use it. It is a curious fact that neither Trousseau nor others took any notice of an instrument proposed and presented in 1825 to the Institute by M. Caguiard de Latour, especially as Fournié affirms that it was the first discovery of the laryngoscope. It consisted of a small mirror, which was to be introduced into the fauces and, by the aid of another as a reflector, to catch the solar rays and reflect them and illuminate the epiglottis and the glottis. Its practical application allowed only the inspection of the epiglottis. M. Latour lacked perseverance, or he might have been the successful discoverer. Benniti, of Paris, in 1832, had asserted his ability to see the vocal cords with Sellique's instrument—his double-tubed speculum, of which one tube served to carry the light to the glottis, and the other to bring back the image to the eye. Trousseau discredited this statement, and undertook, in his work on laryngeal phthisis, to prove that the epiglottis formed an insuperable impediment to a view of the interior of the larynx. Trousseau's rejection of Sellique's and Benniti's instruments, by the weight of his name and position, was calculated to defer the discovery of the laryngoscope.

In his clinic on œdema of the larynx, as reported in the last edition, Trousseau, or his editor, says: "The laryngoscope has been carefully studied in England and Germany; when it has attained a

greater degree of perfection it will, no doubt, render service not only in the diagnosis, but also in the treatment, of laryngeal affections."

If he were living, how cordially should we welcome him to witness the perfection its application has reached! He would be as dazed as Rip Van Winkle was when he awoke from his prolonged sleep.

Dr. Horace Green, as a very young man, was impressed, in several cases of follicular disease of the throat in which he had become interested, with the uncertainty attending their treatment. He went abroad to visit the hospitals of Europe to see if there had been any discoveries in connection with the pathology and treatment of the diseases of the larynx and the adjacent organs. In a casual conversation he had with Dr. James Johnson, the editor of the *British and Foreign Medical Review*, in alluding to the difficulties and uncertainty which attended the treatment of laryngeal disease, Dr. Johnson intimated that all modes of treatment would fail us until appropriate therapeutic agents could be applied directly to the lining membrane. This remark, in connection with Green's past experience of the nature of the disease, and especially of its local character, made an abiding impression on his mind, and suggested the idea of the possibility of medicating the cavity of the larynx by catheterization. This was in 1838.

He made for himself a probang, with which he commenced introducing a solution of nitrate of silver into the pharynx and into the larynx. He found at first some difficulty, but he gradually made himself very expert in catheterizing the larynx and the bronchi. He met with such success that he soon made a reputation and enjoyed an increasingly large practice.

His first work was a treatise on *Bronchitis*, published in 1846. In this he advocated strongly, amidst much opposition, topical applications of nitrate of silver to the interior of the larynx and catheterization. He gave numerous cases where he had succeeded. These were in addition to the cases previously, in 1841, reported to the Medical and Surgical Society of New York. A committee of this society, appointed in 1847, condemned his practice. The members repeatedly and publicly denied the possibility of cauterizing the interior of the larynx. Why is it that there are always persons who are persistently incredulous and cavil at new things?

A resolution was offered asking Dr. Green to withdraw from the society. His offense was that he had repeatedly performed an operation which even a professor of anatomy declared impossible, although

accidentally in many cases particles of food, besides bits of coin and other foreign bodies, had passed unhindered through the glottis. Others accused Dr. Green of imitating Trousseau and Belloc. Dr. Green warmly defended himself against the charge of having imitated Trousseau and Belloc. He stated that he had commenced his method of cauterizing two years before he knew of the writings of Trousseau and Belloc. He admitted that to them belonged the credit of having been the first to prescribe and employ topical medication in chronic diseases of the larynx. He maintained that he was the first to pass a sponge-probang loaded with a strong solution of nitrate of silver below the epiglottis, through the larynx and rima glottis, down into the trachea, thus reaching disease of these parts with more certainty.

Trousseau's method was to saturate the sponge with the solution of nitrate of silver; next, the mouth being open, to depress the tongue with the handle of a spoon and introduce the porte-caustique. As it is passed over the isthmus of the gullet, it produces an effort of deglutition which raises the larynx. This moment is seized upon for bringing forward the sponge, which, in the first part of the operation, had been carried to the entrance of the œsophagus. By this means he reached the opening of the larynx by elevating the epiglottis; and then, by pressure, it was easy to pass the caustic solution into the larynx. Dr. Green deserves the honor of having been the first to persist in this treatment, and practically he was the inventor, but he was not the discoverer. Sir Charles Bell made applications of caustic to the respiratory mucous membrane as early as 1816. In his work, *Surgical Observations*, will be found a record of these cases. In one case of extensive ulcerations of the glottis he says: "I made a small pad of lint, and attached it to the ring of a catheter wire after bending it so as to pass it over the tongue and epiglottis. I dipped the lint in a twenty-grain solution of caustic, and touched the glottis with it in this manner: With the finger of my hand I pressed down the tongue and stretched the forefinger over the epiglottis; then directing the wire along my finger, I removed the point of my finger from the glottis, introduced the pad of lint into the opening, and pressed it with my finger."

This treatment was considered hazardous and was abandoned. Mr. Vance, a naval surgeon of eminence, was in the habit of employing topically a solution of nitrate of silver in the treatment of laryngeal diseases. Dr. Stokes mentions Mr. Cusack as having introduced nitrate of silver by saturating a piece of lint sewed on the end of his index finger; by these means the solution was carried with great

facility to parts of the pharynx and even to the rima. Trousseau contends that his master, Bretonneau, as early as 1818, carried over the arytæno-epiglottic ligaments a sponge wet with lunar caustic to the entrance of the larynx; yet Trousseau denied that Dr. Green or any one else could introduce instruments below the vocal cords; indeed, he maintained that the operation was impossible.

Dr. Green lived to see the best men abroad and in this country candidly admit that he had done as he reported that he had. Dr. Cotton, Dr. Hughes Bennett, Dr. Fordyce Barker, Dr. Sayre, Dr. Carnochan, Dr. Sims, Dr. Praslee Davis, Dr. Bowditch, of Boston, and Professor Davis, of the University of Virginia, had seen Dr. Green demonstrate the entrance of instruments into the larynx and trachea. They had all seen the passage of air coming through the catheter blow out the candle. Dr. Sayre, always fearless and truthful, so testified before the New York Academy of Medicine. An overwhelming demonstration was made at the request of Dr. Carnochan. Dr. Green introduced the probang through the larynx of a man who had attempted suicide by cutting his throat, and in whom the orifice in the trachea had never healed. Dr. Green passed the probang until it made its appearance at the opening in the trachea. This proved that there was no anatomical impossibility, as Trousseau had contended, of catheterism of the larynx.

Dr. Green wrote vigorously on the *Local Origin of Constitutional Diseases*, the converse of Mr. Abernethy's work on the *Constitutional Origin of Local Disease*. He advocated topical medication as of vast importance. This showed his independence of thought and his boldness in expressing his views at a period in the history of medicine when there existed such superstitious over-confidence in drugs administered internally for all the ills of life. He cared not for the unpopularity of thus combating polypharmacy. He had, it must be admitted, too implicit faith in the topical application of his favorite local application—nitrate of silver—for follicular disease, croup, spasmodic asthma, laryngitis, chronic bronchitis, and other diseases of the respiratory organs.

Dr. Green's work on *Polypi of the Larynx and Œdema of the Glottis* (1859) shows that the thoughtful observation of the author was turned toward the interior of the larynx, and that he was not to be led by traditional teaching, either in his views of laryngeal pathology or in his practice. Dr. Green did not hesitate to express the opinion, and to leave it for future experience to confirm or invalidate, that foreign growths occurred in the opening of the air-

passages in many instances where their presence was neither suspected nor discovered; and that, if the attention of the profession should by any means be directed to this subject, it would be found that the existence of polypi and other excrescences in these passages was an occurrence much more frequent than had been supposed. On this point of pathology Dr. Green was far in advance of his day.

He diagnosticated the presence of these neoplasms by close and careful inspection, together with the subjective symptoms; he operated for their removal by laryngo-tracheotomy, and he healed cases of œdema of the glottis by scarifications and strong solutions of nitrate of silver.

In Dr. Green's article, published in 1857, on Lesions of the Epiglottis, there is a careful description of the minute anatomy of the cartilage, showing that its mucous membrane adheres closely to the cartilage on the laryngeal face, there being no areolar tissue interposed between the lining membrane and the cartilage, whereas beneath the mucous membrane on its anterior or lingual surface considerable areolar tissue is deposited. Disease, therefore, affecting this fibro-cartilage must have its seat either in the mucous membrane or its follicles or in the subjacent areolar tissue.

He reviews the physiology of the epiglottis, calling attention to its very slight sensibility in health. While in its normal condition it is almost insensible—for it may be touched by the finger or with the handle of an instrument without producing any irritation—yet when it is inflamed it becomes much more sensitive and causes pain. When the lips of the glottis are reached a convulsive cough is produced. Dr. Green dwells on the function of this cartilage, together with other parts, in the protection of the larynx, as also of the supraglottic space. He writes, first, of the erosions or abrasions of its mucous membrane; secondly, of ulcerations of the membrane and of the glands; thirdly, of œdema or infiltrations of its areolar tissue.

These lesions of the epiglottis he justly maintains are of much greater frequency than has been generally supposed. Persistent coughs have been kept up by the presence of undetected erosions of the epiglottis. These he had greatly benefited by applications of lunar caustic. Dr. Green contended that the direct medication of the lungs by means of catheterism of the air tubes, an operation not before performed by any one, he had repeatedly accomplished, that the operation might be performed by the dexterous surgeon with ease and facility and with perfect safety to the patient, and that the results of this method of treating disease, whether it had been em-

ployed in bronchial affections or in the commencement of tuberculosis, had been very encouraging. Dr. Green reported one hundred and six cases of tuberculosis and chronic bronchitis treated by him, especially by catheterism of the air-passages, with great success. Following Dr. Green, Professor Hughes Bennett reported that he had repeatedly acted upon Dr. Green's suggestion with success. In Green's report (1859) on the Difficulties and Advantages of Catheterism of the Air-passage, he quotes freely from Bennett, Trousseau, Loiseau, Blondeau, and others—all strongly in favor, from their personal experience, of injecting the air-passages. The death of Mr. Whitney fourteen days after Dr. Green had passed an instrument into his throat prejudiced many; he had pushed the instrument with some force through an obstruction. In operating, he felt something give way—an abscess probably. Mr. Whitney's death created a great sensation. Trousseau, Bennett, and Rokitansky wrote letters after receiving the details, stating that they did not think the operation had anything to do with it. Trousseau said the abscess existed before the operation.

Dr. Horace Green encountered great opposition throughout his professional life. His originality and his persistent maintenance of his views, which he knew were founded upon close observation, attracted much attention and caused no little jealousy. I may be allowed to say that, after having practiced in 1854 upon Dr. Green's views, and subsequently (1859) with M. Buchut's suggestion in catheterizing the larynx, I determined to go to New York to see Dr. Green and to get some practical points from him. I did so, but, after reaching New York, I was dissuaded by prominent New York physicians from calling on him. Some of them said he was a charlatan who was guilty of pretending to do what he could not do. I now regret that I left the city without seeing him.

This occurred when the feeling against Dr. Green had culminated and a committee of the New York Academy of Medicine had been appointed to investigate Dr. Green's views. So great was the feeling against Dr. Green in New York that the Academy of Medicine, after their committee had made their report, which was a divided one, although they could not convict him, did him the injury of allowing no vote to be taken, and the report remained for over five years on their table unacted upon. Afterward, although men of the highest character indorsed him and his statements, they did not, as far as I can ascertain, withdraw the charges against him.

Why was Dr. Green so unpopular with his professional brethren?

He certainly was a gentleman of high culture and great ability, very laborious, conscientious, and persevering. His great success made him a mark for jealousy. His studies and his taste led him to carve out for himself a specialty when specialties were not considered allowable. All specialism, particularly ours, was considered questionable from an ethical point of view.

Dr. Green was calculated to be a leader in medical thought. Had his health permitted, he would have availed himself in his declining years of Garcia's discovery, and no doubt would have enriched the new science of laryngoscopy by his accurate observations.

Time and justice have rescued his reputation. As Americans we are proud of him. We gratefully acknowledge that his works revolutionized the pathology and treatment of laryngeal disease. "His researches," says our eminent president, "formed an epoch in the study of laryngeal inflammation." They dissipated the clouds that surrounded laryngology and assisted at the dawn of laryngoscopy.

Our former secretary, in his wonderfully accurate photograph of our fellows, appropriately placed Dr. Horace Green as the central figure.

Paper.

NOTES ON AN INTERESTING CASE OF ANEURYSM.

By GEORGE W. MAJOR, M. D.

M. K., male, German, aged thirty-four, while walking in the street was suddenly seized with intense dyspnœa, and as he was in the vicinity of the Montreal General Hospital he made immediate application for relief. Dr. Richard L. MacDonnell, one of the physicians, was in the building at the time and admitted the man into one of his wards. As suffocation was imminent, I was summoned in consultation, and intubation of the larynx was decided upon. When I saw the patient, a few minutes after his arrival, his condition was desperate in the extreme and most painful to witness. He was unable to speak, his face was purple and swollen with blood, and he forced his finger tips into his ears in his efforts to relieve the pressure on the drum heads. I introduced an O'Dwyer tube of large size into the larynx, which afforded sensible but gradual relief. After the severity of the paroxysm had somewhat subsided I withdrew the tube, and succeeded in making a laryngoscopic examination, to which reference shall be made hereafter. When able, the patient stated that he had served in the Franco-Prussian war. He denied ever having had syphilis; had been married seven years; his wife had one child and had not miscarried. He was employed as a storeman, and was in the habit of lifting

very heavy weights. He had not suffered from cough or pain in the chest. During the last two months he had several attacks of dyspnœa, but always found relief in the application of mustard. He was a large, well-built man, with a splendid development of chest, covered deeply, however, with a thick layer of fat. The pupils were of equal size, the radial pulses were equal, and there was *no tracheal tugging.*

Physical examination of the chest revealed simply diminished respiration over the left side. No dullness on percussion was at any time established, due, doubtless, to the great thickness of the thoracic walls.

The patient survived six days, and in that time was never quite free from dyspnœa. Intubation and catheterism were practiced twice during his residence in hospital, when death appeared imminent, but always with but modified relief. Finally, termination was by syncope. There was no doubt at any time existing in our minds as to the character of the case.

At the autopsy the clinical diagnosis of aneurysm was fully confirmed.

A saccular dilatation in the transverse and descending arch, about the size of a small orange, was found. The left bronchus, which passed immediately behind the sac, was almost obliterated. The rupture occurred at this point of constriction, and a number of nerve fibers connected with the pneumogastric and left recurrent laryngeal nerves were involved in the extravasation. The rupture took place into the posterior mediastinum, and there was secondary hæmorrhage into the stomach. Hæmorrhagic infarction of the pneumogastric, but particularly of the left recurrent, was observed at the post-mortem examination.

From the laryngologist's point of view, this case presents a number of interesting features and suggests a variety of considerations. Intubation did not afford the immediate and complete relief that one would expect in a case of purely glottic obstruction. The laryngoscopic examination showed the left vocal cord fixed at the middle line, left abductor paralysis with adductor spasm. The right vocal cord, though moving through its field, underwent intermittent spasmodic movements; the tendency was, however, decidedly in the direction of adduction. In this particular case the laryngeal image proved of great value as a means not only of assisting in the diagnosis of aneurysm, but also in estimating the part the larynx played in producing the dyspnœa. We might even go further and say that (taking into consideration concomitant circumstances, of course) the image was characteristic of pressure on the left vagus, or, at all events, pointed in that direction. Pressure on the vagus will produce abductor paralysis of the same side with adductor reflex spasm of the laryngeal muscles of the opposite side. In deciding these points, due allowance must be made for the stage of advancement of the aneurysm at the time of examination. If the pressure had been on the left

recurrent nerve only, the vocal cord of the left side would have been affected and the dyspnœa would have been intermittent instead of having the permanent character it exhibited. Pressure on one recurrent nerve does not affect phonation and is not likely to give rise to troublesome dyspnœa; but pressure on one vagus, inducing double adductor spasm, as it does, will produce serious results.

I stated a moment ago that the position of the vocal cords depended somewhat on the duration of the disease and on the amount of pressure exerted. I have occasionally observed in the course of an aneurysm that the image so varied from time to time, after a considerable interval, that I was led to doubt the accuracy of a previous delineation in my register. This change is more readily observed in a case of pressure on one recurrent nerve. For instance, in recurrent pressure there may be early in the case some dyspnœa, but rarely any voice affection; on examination, we find the vocal cord on the side of pressure at the middle line—abductor paralysis. Later on the dyspnœa disappears, but the voice is impaired. The laryngoscope shows the cord of the same side at the cadaveric position—complete paralysis; the adductor fibers have become involved. The patient now suffers from phonatory leakage. He can inspire freely enough, but he can not economize his air and is easily put out of breath in consequence; his cough also is difficult; the mechanism of cough is interfered with. At a still later stage the voice may improve; this is the result not of local improvement in the case, but of the compensating action of the vocal cord of the opposite side approaching its fellow to produce vocal effect. The same state of things no doubt may occur in vagus pressure modified by the difference in the conditions. Personally, I have not had an opportunity of following vagus pressure for a sufficiently long period to speak with any authority. The late Professor Elsberg, of New York, formulated a law with the object and intention of explaining these somewhat curious facts. He maintained that "the abductor filaments of the nerve are more prone to be affected than the adductor filaments, and that if in a given case in which both the abductors and adductors are affected recovery takes place, the adductors are apt to recover first or exclusively and to be affected with abnormal contraction, so that the patient during the progress of recovery is in danger of a dyspnœa which may necessitate a tracheotomy in order to prevent death." In practice this law has received abundant confirmation, and, in the absence of any satisfactory explanation of a theoretical nature, we can not, I think, do better than accept it.

In the case I report, the laryngeal condition was due either to pressure on the left vagus or to pressure on the recurrents of both sides. In either case great dyspnœa would be present, and in the comparative absence of physical signs it became a nice question of diagnosis. The case was not seen until pressure on the vagus had been set up, but, from the history given by the patient himself, pressure on the left recurrent laryngeal had preceded it for some months. The obstruction offered to the entrance of air into the left lung, and the altogether greater frequency of aneurysmal pressure on the left side, were valuable considerations in arriving at a correct diagnosis. In the present instance there were no physical signs of any value present excepting the pressure on the left bronchus. The laryngeal indications were therefore paramount, and, when associated with certain collateral indications, a diagnosis was not difficult. In every case of loss or impairment of voice, and in every case of dyspnœa, an expert laryngoscopic examination should be made; it no doubt would often clear up obscure symptoms and enable us to properly estimate their true value. In the course of this case there is no doubt that the attacks of dyspnœa of the greatest severity were the result of pressure exerted by the succession of hæmorrhages that took place. We have no direct proof of this, but we made tolerably certain by intubation that the larynx was not entirely at fault. The question of tracheotomy was raised at different times for the relief of the dyspnœa, but was negatived for the following reasons: In the first place, intubation failed to give the instantaneous relief it should have afforded in a case of purely laryngeal obstruction. In the second place, there was a general absence of the usual signs of laryngeal dyspnœa—for example, the larynx was stationary in the throat; it did not descend during inspiration. There was no suprasternal depression and no diaphragmatic retraction. The voice was weak, the cough and inspirations were asthenic, and the muscles of the chest were quiescent. The abdominal walls were, however, in a state of great and continued activity, especially during expiration. Had the dyspnœa been of a laryngeal nature I should not have hesitated to perform tracheotomy, not only for the relief of breathing, but also as a means of delaying the rupture of the sac.

I mentioned the absence of *tracheal tugging* in this case, and, as it is a symptom of aneurysm but little known, will say a few words concerning it before closing. Tracheal tugging was first described as a symptom of aneurysm of the arch by Dr. W. S. Oliver* (surgeon-

* *Lancet*, September 21, 1878.

major in H. B. M.'s regular army, retired), of Halifax, Nova Scotia. It has been recognized in the practice of the Montreal General Hospital ever since, but there has seemed to exist some doubt as to the exact way in which the "tugging" is brought about.

When the aneurysmal sac is immediately over the bronchus the direct pressure downward produces this symptom, which is synchronous with the pulse, whereas if the sac is behind or before there is no effect produced. Dr. MacDonnell, Professor of Clinical Medicine in McGill University, first gave me this explanation of the phenomenon, which I have since proved by reference to case reports. To detect this symptom the patient is placed seated upright in a chair with the mouth closed. The trachea is drawn upward by traction on the cricoid, and if "tugging" is felt you can be, in so far as my knowledge and experience goes, pretty certain of an aneurysmal sac pressing downward on the left bronchus.

The autopsy in this case was made by Dr. Wyatt Johnston, pathologist to the hospital, and my short report of the appearances was abstracted from the hospital register.

Paper.

A CASE OF MYXOMA OF THE EPIGLOTTIS.

By S. O. VANDER POEL, M. D.

THE rarity with which myxomata present themselves in the neighborhood of the larynx, and the fact that but few cases have been placed on record, have induced me to bring before you for consideration the study of this form of benign growth, and the recital of a case which has recently come under my observation.

The patient, a German, fifty-four years of age, by occupation a blacksmith, was perfectly well until seven months ago, when he began to notice failing strength and loss of flesh. Some weeks later his throat commenced to annoy him; there was difficulty in deglutition, with the sensation of a foreign body in the throat. As he expressed it, "an obstruction to the passage of food, and a tendency for it to go the wrong way." At no time was any actual pain complained of. Talking was an effort and was carried on with fatigue, amounting at times to actual distress. Only occasionally was there hoarseness, and then after prolonged use of the voice. It then might more properly be described as a feeble whisper which it was difficult to understand. Occasionally the peculiar staccato inflection was noticeable. At night there were suffocative at-

tacks, when he would awaken suddenly from his sleep with the feeling of great apprehension and the sensation of strangling. Of late these attacks have been more frequent, and would seem to be produced by some mechanical obstruction to the entrance of air. When he first came under observation at the Throat Department of the Manhattan Eye and Ear Hospital on the 17th of March last he was emaciated, and, from a large and powerful man, had become a weakly invalid, who walked with effort and apparent distress. This condition he ascribed to the small amount of nourishment he had been able to take of late, as he could swallow but liquid food, and that in small quantities. A harassing cough had been present for some months, and considerable difficulty was experienced in expectorating the mucus which gathered in the throat. He complained of an intermittent pain in the cardiac region. Physical examination disclosed a loud blowing mitral murmur heard over the entire sternum, with dilatation of the left ventricle. The lungs were emphysematous, with evidence of chronic bronchitis. Respirations, 28 to 30; pulse, 90. Rhinoscopic examination revealed some slight hypertrophic rhinitis, the left middle turbinated body being in contact with the septum, together with an ecchondrosis of the septum of the right side, but nasal respiration was not materially interfered with. With the laryngeal mirror a tumor of a yellowish-red color, translucent, of about the size of a horse-chestnut, was seen springing from the lingual side of the epiglottis; the surface was glistening, lobulated, and traversed by numerous small vessels. It was attached by a broad base to the glosso-epiglottic fossa of the left side. It occupied so much space in the pharynx and pressed the epiglottis to such an extent that only a small portion of the laryngeal image could be seen. Palpation with the laryngeal probe and finger showed it to be of soft consistency, and imparted the sensation of fluctuation. By elevating the neoplasm, the right free margin of the epiglottis could be distinguished with the finger, but, in passing over to the left border, the free edge of the epiglottis was lost in the growth. From its consistency, color, and general conformation, an epiglottic cyst was diagnosticated, but aspiration failed to withdraw any fluid. It was accordingly decided to remove the growth with the galvano-cautery snare. This was done under cocaine anæsthesia the following day. Twenty-five minutes were occupied in the operation, which was accomplished with little difficulty and no hæmorrhage. It was found to have been attached by a broad base to the entire left lateral half of the lingual side of the epiglottis. It resembled an adenoma, its surface being lobulated and traversed by fine capillary blood-vessels and inclosed in a fibrous capsule. It was submitted for microscopic examination to the pathologist of the hospital, to whom I am indebted for the following report: The capsule inclosing the tumor is about 1 mm. in thickness, and is composed of mucous membrane that in no way differs from the ordinary membrane covering the epiglottis. This envelope, which can be readily stripped from the tumor, is covered by stratified pavement epithelium, the underlying membrane being fibrous

tissue of loose texture, containing a network of numerous and wide lymphatics. The mucosa is dense, and projects, in the form of numerous small papillæ, into the epithelium. A network of capillary blood-vessels is distributed in the superficial portion of the mucous membrane. The substance of the tumor proper conforms to the description of hyaline myxomatous tissue. In the hyaline ground substance, which is composed of a fibrillary connective-tissue network of extreme delicacy, are imbedded the characteristic stellate cells, some of which anastomose by their prolongations, while others again are without any processes, being nearly round. Pure myxoma is so uncommon that several sections were made in different portions of the tumor to ascertain if some sarcomatous tissue might not be present. They all, however, presented the same structure as described above. The growth is therefore a pure hyaline myxoma. [Signed: Ira Van Giesen, M. D., Laboratory of the Alumni of the College of Physicians and Surgeons, New York.]

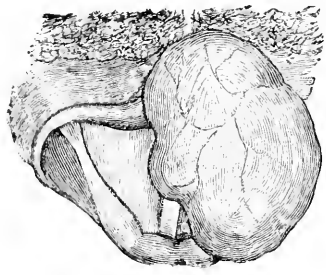


Fig. 1.

There were no inflammatory symptoms in the throat following the operation, and in the course of two days the patient could swallow without pain or discomfort. His appetite and strength, however, failed to return, and, there being a lurking suspicion of some malignant trouble elsewhere, he was advised to place himself in the German Hospital, where he came under the care of Dr. Isaac Adler. From the notes taken after his admission to the hospital, we find that several examinations of the blood were made which showed a marked degree of anæmia; in one cubic millimetre of blood there were but 1,000,000 red corpuscles and 400,000 white. The corpuscles were of normal size and shape. The spleen was normal and there were no glandular swellings, except some slight cervical enlargements. In the washings of the stomach after a test meal no hydrochloric acid was found, which tended to confirm the diagnosis of cancer. The urine contained traces of albumin but no casts. After the lapse of several weeks a slight recurrence of the growth on the epiglottis was noticed; it occupied the seat of the original tumor, was slightly elevated above the surface, and of a dark color.

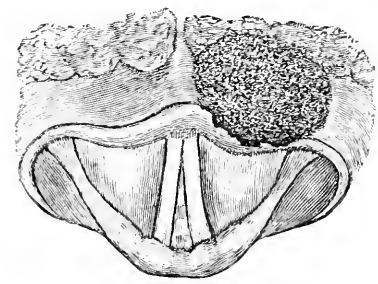


Fig. 2.

The patient gradually sank, and died in the first part of May. On

autopsy, all the organs were markedly anæmic; the lungs were found to be emphysematous, with evidences of chronic pleurisy. The heart muscle was anæmic and fatty. Endocarditis existed which had resulted in mitral stenosis, the left ventricle being dilated. Slight parenchymatous nephritis, one kidney being red and the other white. The mucous membrane of the stomach was atrophied and the organ slightly dilated. The liver was somewhat shrunken and anæmic, but otherwise normal. Spleen normal. In no organ was there found any evidence of cancerous disease.

The fatal termination of this case would seem to be only indirectly due to the throat lesion, for, as the growth was surely of a benign nature, it could only have affected the issue by the inanition it caused previous to its removal. The cause of death, then, should be ascribed to pernicious anæmia, as this was undoubtedly present, as is evidenced by the diminution in the number of red corpuscles from 5,000,000, the normal number, to 1,000,000—while the white corpuscles were present in their normal proportion, about 400,000; also by the fatty degeneration of the heart muscle, the endocarditis, and dilatation of the left ventricle, and finally the atrophic changes found in the mucous lining of the stomach. Although pernicious anæmia has no symptoms that may not occur in other forms of anæmia, there are, nevertheless, certain symptoms which, especially in combination with each other, are more frequent in the pernicious than in the secondary or symptomatic anæmias. These symptoms, which, therefore, are in a degree characteristic, although not pathognomonic, of pernicious anæmia, are an excessive degree of anæmia; the preponderance of the anæmia over all other symptoms; the progressive and malignant course, often uncontrolled by therapeutical agents; the absence in many cases of emaciation, the intensity of heart murmurs without valvular lesions, and the frequent prominence of digestive disturbances. Upon post-mortem examination, fatty degeneration of the heart, and at times certain changes in the marrow of the bones, are observed with a greater degree of constancy and of intensity in pernicious than in symptomatic anæmia. The clinical history of our case taken in its entirety is therefore sufficiently characteristic to justify us in making the diagnosis of pernicious anæmia.

Pernicious anæmia and pseudo-leucocythæmia are frequently associated with, or rather accompanied by, new growths located in different portions of the body. These vary greatly in their size, location, and anatomical characteristics. Mosler, in the course of an article on Pseudo-leucocythæmia in Ziemssen's *Cyclopædia*, calls attention to them: "The follicles of the tongue and tonsils are

sometimes much enlarged, whitish and pulpy on section; also upon the surface of the epiglottis soft, shiny, and translucent nodules, varying in size from a pea to a hazel-nut, at times single and again multiple, have been found." They project above the surface and interfere more or less with the function of the part, according to their size and location. Thus pressure upon the larynx or trachea may obstruct respiration, and death in pseudo-leucocythæmia is sometimes due to suffocation from this cause. So also paralysis of the laryngeal muscles may be caused by pressure of one of the growths on the laryngeal nerve. These growths are by no means confined to the respiratory tract, but are scattered through the body in various situations; for instance, the pneumogastric nerve may be involved in a tumor and the action of the heart be retarded; the femoral vein may be compressed and œdema of the lower limb follow; jaundice has been attributed to pressure on the bile duct, etc. It is, then, to this class of tumors that our case properly belongs. It differs in some respects from those cases of laryngeal myxomata already reported—in the first place, by being associated with pernicious anæmia and terminating fatally, and in the second by the recurrence that took place. In a review of the literature of the subject we have been able to find but few cases of this form of benign tumor recorded, if we exclude those in which no microscopic examination was made. Sir Morell Mackenzie observed one on the right vocal cord that also had certain mucous characteristics. Bruns reports a case of pure hyaline myxoma which was attached to the right wall of the larynx, was of an irregular pear-shape, yellowish-red in color, dense but elastic in consistency, and almost completely occluded the entrance to the larynx. J. Solis-Cohen, in the *Transactions of the Pathological Society of Philadelphia* for 1873, mentions a myxomatous growth which he removed with forceps. It was multiple and pedunculated, attached apparently to the anterior portion of the thyreoid cartilage just below the glottis and to the left of the middle line. The growth was distinctly lobulated. The characteristic stellate cells, some anastomosing, imbedded in a hyaline ground substance, were shown upon microscopic examination. Tauber has operated upon one case of hyaline myxoma which was attached by a broad base to the entire anterior or lingual surface of the epiglottis. Thompson and M. Schmidt have had similar cases. Eemann, in the *Revue de laryngologie* for February, 1889, reports two cases, both of which were located on the vocal cords. These cases, together with the one here related, make a total of nine—cer-

tainly a small showing when we consider the immense number of laryngeal neoplasms yearly recorded. The differential diagnosis of these growths *in situ* from cystic tumors, and at times from fibroma, is most difficult if not impossible. Eemann states that he made an error in diagnosis in both of his cases. Basing his diagnosis on the consistence, color, and transparency of the growths, he thought they were cysts until the microscope showed them to be hyaline myxomata. This fact would seem to arouse the suspicion that perhaps many cases that have heretofore been classed as cysts in reality, if microscopic examination had been made, would properly have come under the head of myxoma. Would it not, therefore, be fair to assume with Eemann that it has not been scientifically proved that hyaline myxomata are so uncommon as we have hitherto been led to suppose?

Discussion.

The PRESIDENT: We often draw incorrect inferences with regard to the rarity of diseases by the infrequency of reports of such cases in medical literature. I think that, whereas this growth in the locality described by Dr. Vander Poel is rare, the same growths, occurring lower down in the larynx, are not of such rarity as might be inferred from the published records.

Dr. SWAIN: I remember removing such a growth from the fossa glosso-epiglottidea, just at the junction of the epiglottis and the tongue, which was a simple polypus, strictly a mucous polyp, resembling those of the nose in every respect, except it was more consistent.

Dr. VANDER POEL: In reply to the chairman I would simply say that myxomata are essentially embryonic tissue tumors, as myxomatous tissue is only present in the normal adult in a very imperfect and atypical form —as in the vitreous of the eye—and in small amount in the medulla of bone. It is, however, a tissue which readily undergoes transformation, and pure myxomata are not common. They are apt to be combined with fibrillar connective tissue, as fibro-myxoma; or with fat tissue, lipomyxoma; and they frequently become sarcomatous, or take part in the formation of complex tumors. It is therefore to this class of tumor, this degenerated or transformed myxoma, that I believe the chairman refers when he speaks of their frequency. What I referred to was a pure gelatinous growth, characterized by stellate fusiform cells, often anastomosing, imbedded in a homogeneous or finely fibrillated, soft, gelatinous basement substance. The case mentioned by Dr, Swain is undoubtedly analogous to the one I have reported. Probably in most cases the diagnosis is made from the macroscopic appearances, and is not confirmed by microscopic examination. I think that originally the growth may be a hyaline myxoma, but subsequently undergoes a change such as I have referred to.

Paper.

LOOK BEYOND THE NOSE.

By SOLOMON SOLIS-COHEN, M. D.

THE benefits of an enlightened and liberal specialism are so generally admitted that it is unnecessary to recount them. But while liberal and enlightened specialism has contributed and will continue to contribute in largest measure to the progress of medicine, there is a danger, a pressing and increasing danger, that narrow and unenlightened specialism will offer hindrance equally great.

There is a tendency, more especially upon the part of those who have had insufficient experience in general medicine—or perhaps not any—before undertaking exclusive practice, to magnify the importance of local lesions coincident with certain general disorders of the system, or with local disease in some other region. While this tendency is perhaps most strikingly manifested by some others, yet nowhere is it more pernicious than in the domain of rhinology. To discuss particulars rather than generalities, and selecting a single particular as type in order to save time—especially have malformations and enlargements of nasal tissues been advanced as the sole and efficient cause of persistent and distressing headaches.

That in some cases this is true the experience of competent observers places beyond question, but that it is true to anything like the extent one would infer from many contributions to the literature of the subject, my own experience at least leads me to doubt. In illustration of this fact I desire to report three cases, typical of many:

Case I.—Mrs. R., thirty-two years of age, consulted me in the hope of obtaining relief from a headache, which she said was dependent upon nasal trouble, and from which she had suffered more or less since she was twelve years of age, but more particularly during the last decade. She had been for something like two years—though latterly quite irregular in her visits—under the care of a specialist of ability, who had told her that her headache was due to trouble in the nasal cavities, although of what exact nature she had not been informed; and she had undergone several operations, two of them under ether. She did not know what had been done. During treatment antipyrine had been prescribed for temporary relief of paroxysms of headache.

Examination of the nose showed a badly deviated septum in contact with the middle turbinated body on the left side, a polyp attached to the

middle turbinated body on the right side, with a general condition of chronic inflammation and thickening of the mucous membrane. The pharyngeal tissues were also thickened and inflamed. As a matter of course, the polyp was removed from the right nasal passage and the point of implantation cauterized. This, however, while it relieved some distress in breathing, had no effect on the headache, which was as persistent and as painful as ever. The nose was kept clean by an alkaline detergent wash, and as, notwithstanding the deviation of the septum, sufficient air was obtained for purposes of respiration, no further operative interference was undertaken, while the attempt was made to determine the course and cause of the headache independently of the nasal conditions. It was ascertained that there would be two or three days comparatively free from headache, and then for two or three days more a succession of paroxysms.

Studying these paroxysms, the fact was developed that they occurred principally in the afternoon—that is to say, while beginning in the morning, severity was not marked until about twelve o'clock, and the maximum of pain was reached at six o'clock in the evening, after which the pain gradually faded away. This suggested a possible malarial origin, and a history of attacks of intermittent fever, once previous to the first appearance of the headache and twice subsequently, was elicited. No enlargement of the spleen or liver was detected; heart and lungs were normal; nothing of pathological import was found in the urine. Unfortunately, the blood was not examined for plasmodia. The patient said she could not take quinine on account of the ringing in the ears soon produced; nevertheless, quinine hydrobromide was administered in doses of fifteen grains daily, divided into three portions, of which the first was taken upon getting up in the morning, about seven o'clock, the next at ten, and the next at twelve. In addition, five grains of salicin with two of ergotin were taken at 6 P. M. and again at bedtime. The first day there was a slight headache about four o'clock in the afternoon which lasted but a short time. The same thing occurred the following day, and the daily dose of the quinine salt was increased to twenty grains. Since that there has been increasing freedom and finally no return of headache for a period of more than a month. Medication has been modified accordingly. The patient states that in twenty years she had not previously been free from headache for a week. This is an exaggeration I believe, but it may be accepted as a fact that, at least, she is very much better now than at any time during that period, and that the improvement is due to constitutional and not to local treatment.

The nasal septum remains deviated and in contact with the middle turbinated body.

Case II.—Mr. Y., aged twenty-one, has a deviated and thickened septum in contact with the middle turbinated bodies on both sides, a posterior enlargement of the lower turbinated body of the right side, and also engorgement of the erectile tissue upon each side of the bony

septum posteriorly. He has no reflex troubles of any kind, and says he does not know what headache means.

Case III.—Miss X., aged twenty-seven, has had excruciating headaches and occasional periods of insomnia for years, and has been under the treatment of a number of practitioners, specialists in various lines.

The first physician whom she consulted—a woman—attributed her troubles to the uterus, and she was for three months an inmate of a sanitarium, undergoing special treatment. Her next adviser scouted the uterine theory and found a sufficient cause for her distress in refractive errors of the eyes, which he corrected. The third believed it to be entirely nervous, curable by electricity, which he applies indeed to the treatment of all diseases, and she says that he benefited her more than either of the others. The fourth, fifth, and sixth were homœopathists, the seventh a gynæcologist, and I had the honor of being the eighth. At this time the patient was under the idea that the nose was the *fons et origo mali*.

I found deviation of the septum, thickening of the nasal mucous membrane, and engorgement of the glandular tissues of the vault of the pharynx. In order to determine whether the nose was really the source of this patient's long-continued distress, I treated it, and succeeded in relieving what slight nasal symptoms existed and in so far rectifying the deviation of the septum as to obviate any contact of tissues; but neither the headache nor the insomnia was benefited in the slightest degree. The patient was hysterical, there could be no question of that; but careful inquiry into her general health showed a condition of feeble digestion and atony of the intestine associated with gastro-intestinal catarrh and a consequent lithæmia. Treatment was directed to this condition, with improvement, but not absolute cure. Becoming dissatisfied with her slow progress, the patient consulted a ninth adviser—a second oculist, who, I know, had never practiced medicine. He found that the previous correction had been all wrong, and consequently had aggravated instead of relieving her headaches and general nervous mal-condition, while his correction was bound at once to restore her to robust health and freedom from pain. That it did not do so is evidenced by her return to me some two months later, when the constitutional treatment was resumed. The patient was not well, but very much improved when I last saw her, and I have no doubt that proper regulation of diet and of daily life carried out faithfully would eventually relieve whatever actual physical pain is present.

These cases are cited simply as instances of what must be common in the practice of every physician who is competent to examine the nose, but also mindful of the facts not only that there are other organs in the human body, but that there is, too, such an entity as a whole organism, not to be looked upon merely as a thing of shreds and patches.

There are conditions of headache and other nervous disturbances,

including asthma, dependent doubtless upon nasal lesions; but men, at least those who, like myself, are in active general practice, meet with a far greater number of cases of these conditions in which there is no nasal abnormity, or in which nasal abnormities are not causative but merely coincident. Furthermore, every fellow of this association must have seen quite a large number of cases—a large majority indeed—of nasal lesions in which none of these nervous phenomena were manifested, as well as many cases in which nasal symptoms themselves were dependent upon systemic causes. The conclusion draws itself; there is no need for elaboration. It is simply this: Let us examine the nose as well as the other organs of our patients, either as a matter of routine or when special indications present; let us treat *secundum artem* whatever nasal condition demands treatment; but let us not forget also to look beyond the nose.

Discussion.

Dr. Roe: The communication which has just been read touches a subject upon which I have myself written a paper; and I have but little more to say on the topic discussed. One point, however, I may refer to: It is the nervous symptoms of nasal obstruction. Headache, of course, always indicates something wrong, some abnormal condition; but any man who attempts to ascribe a headache in every instance to a single specific cause should be regarded as scarcely less abnormal than the headache itself. There are unquestionably a great many headaches produced by diseases of the nose, but this is very far from saying that all headaches are thus caused. We see two cases of headache attended by precisely the same condition in the nose—for example, pressure of a turbinated body upon the septum. In one case the removal of the obstruction will relieve the headache at once, in the other the same treatment will have no effect upon the headache. The explanation of this is that in the latter case the headache is due to some other cause. Where the headache is relieved by an operation it is probably because there was some pressure upon nerve-filaments, the irritation being transmitted to the brain by nerve connection; the operation cures by removing the source of irritation. The result, however, can not always be predicted. We can not always promise that the headache will at once disappear, but the operation is proper under the circumstances. I have seen many cases in which complete relief from a persistent headache followed the removal of a nasal obstruction. About two weeks ago a man with nasal difficulty came to me for treatment. He said nothing about headache, and I did not ask him regarding such a symptom.

Having been relieved of the abnormal condition in the nose—there was marked pressure between the middle turbinated body and the septum—he returned to me very grateful and said that I had cured his

headache also. It seemed that for three or four years he had suffered from headache, and he had been told by a physician, who had unsuccessfully treated him for it, that it was constitutional, and he had made up his mind to bear it for the rest of his life. Thinking it incurable, he said nothing to me about it, and was much surprised to find after the operation that it had disappeared. Of course, the facts in Dr. Cohen's paper go without saying. It is well known that we may have a variety of symptoms from the same cause, and a local condition does not always give rise to the same nervous disturbance. The nasal obstruction may be the primary cause of a headache, or it may be only an incidental concomitant.

Dr. JARVIS: The last speaker has recalled to my mind a thought which may throw some light upon the fact that nervous symptoms appear in one person and not in another. I have seen a large number of such cases in dispensary and private practice and have often noticed this phenomenon. Among the poorer classes we find marked distortion of the nasal septum, and nasal obstruction is very common, but it is apparently not attended by much discomfort, since the nervous symptoms which are usual among the wealthy class are entirely wanting. In reading Stanley's account of his African expedition, I was much interested in his statement that the native Africans paid but little attention to their wounds; and even when severely lacerated and torn, they acted as if their injuries were mere scratches; the wounds, furthermore, healed quickly, in marked contrast to those of the whites of the party, who suffered seriously from the slightest injuries. The blacks for generations had been used to exposure of their bodies, and in consequence their nervous system had become accustomed to injuries of this kind—in other words, they had become less sensitive to external irritation. There is just this difference between the educated or wealthy and the laboring classes: the latter are far less susceptible to external irritations than the former, on account of the inertia of their nervous system. I have found a slight amount of nasal obstruction in a brain-worker producing a great deal of distress, headache, etc., while a much greater amount in a laboring man may give rise to no discomfort at all. The nerve symptoms are due to the increased susceptibility of the central nervous system to peripheral impressions.

Paper.

A CASE OF MYXOMA OF THE NASO-PHARYNX IN A CHILD SIX YEARS OLD.

By ALEXANDER W. MacCOY, M. D.

THE recital of the history of the following case of myxomatous tumor of the naso-pharynx is given because of the rarity of such growths in this region, and also because the extreme youth of the subject adds even more to the rarity. My fellow-members have probably had similar cases in *their* experience, but I am not aware that many such pathological conditions have been put on record by them.

In a rather extended experience in private and hospital practice, this is the first case of the kind which I have seen in so young a child. The occurrence of myxomatous tumors in the *nasal* passages of children is rare, even making due allowance not only for the cases already reported, but also for those not in print, of which we have verbal knowledge. In my own experience I can recall but one case of nasal polypus in a child, and this occurred in an infant under one year of age.

It was seen in the right nostril upon anterior inspection, blocking the respiratory tract, and was removed by the Jarvis snare. This case came under observation in 1883, and during the seven years which have elapsed since I have not seen a similar case. While we seldom see myxomatous development in the nasal chambers of children, the dictum enunciated by Lennox Browne that "polypi may occur at any age" is undoubtedly true. This statement of Browne's should, however, be qualified by acceptance of the doctrine that all myxomatous degeneration or development is dependent upon a prior inflammation in the regions where it occurs; and that the inflammation must have been of some duration. The rarity of these myxomatous developments in childhood can be explained by the fact that there are few children who have had chronic colds of sufficient duration to develop the pathological changes necessary for the growth of polypi. This is not only dependent upon the fewness of years, but also upon the ability of youth to resist true hypertrophic changes. What has been said in explanation of the rarity of myxomatous changes in childhood in the *nasal* chambers applies with even more force to similar changes in the *naso-pharyngeal* re-

gion. Myxomatous development in the naso-pharynx is still more rarely noticed in children—if we accept the consensus of opinion as expressed in literature.

The following case came under my notice in February, 1890. The subject of this history was a patient of Dr. Kennedy, of Clifton Heights, who kindly asked me to examine the case with him.

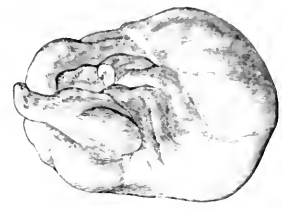
Dr. Kennedy had already clearly made out the tumor, and came for an opinion as to its nature, and also as to measures for its removal. The notes of this case up to the date of removal have been kindly furnished to me by Dr. Kennedy, and are as follows:

Annie I., aged six years, had always enjoyed good health until September, 1888, at which time she contracted a heavy cold by the practice of wetting her hair. This acute coryza developed into a chronic rhinitis. Complete occlusion of the nostrils did not take place until March, 1889, from which time she has not been able to breathe through the nostrils. Through June and July, 1889, she became greatly emaciated; her mouth was kept wide open. There was rapid respiration and loss of appetite. The physician and family were fearful that she would die. She quickly responded to proper remedies and regained her general health. An examination revealed complete occlusion of both nostrils. From the nostrils poured a muco-purulent discharge which filled the nasal chambers. Mouth-breathing was absolutely necessary for respiration. The voice was flat and thick. The expression of the face was quite similar to that seen in cases of hypertrophy of the pharyngeal tonsil.

Examination by the rhinoscopic mirror revealed a large, pale-pinkish mass completely filling up the naso-pharyngeal region. The growth did not show below the soft palate, but could readily be seen upon elevating the palate. There was considerable discharge from the naso-pharyngeal space; not much redness of the fauces, and only a moderate bulging of the soft palate. Examination with the finger showed a large, elastic tumor; the finger could, with some difficulty, be made to pass around the growth. It was only slightly movable and appeared to be firmer than a myxomatous tumor, but not so dense as a fibroid. An attachment (of about half an inch in diameter) was clearly made out, springing from the free surface of the vomer and confined to the lower part of it.

On February 28, 1890, the tumor was quickly and successfully removed (after the application of cocaine and etherization) by the galvano-cautery snare. The long loop of wire was passed through the nostril and gradually insinuated along the upper surface of the soft palate until it could be felt by the finger in the naso-pharynx, when it was widened and carried back to the posterior wall of the pharynx and pushed up by the finger until it could go no farther; the loop was then reeled in, the finger acting as a guide to the base of the growth. After the wire had been

firmly tightened, the current was turned on and the pedicle cut through. The tumor failed to "materialize" in the fauces, and the finger had to be inserted into the naso-pharyngeal space and hooked around it, when the tumor fell out of the open mouth upon the floor. There was but a trifling hæmorrhage. Afterward the child had no reaction, and at once the functions of the nasal chambers were completely restored. Since the date of removal the child has enjoyed perfect health. There has been no recurrence.



The tumor (which I offer for your inspection) weighed six drachms and was pyriform in shape. The report of the microscopic examination is as follows:

"Dear Dr. MacCoy: Dr. Packard has made sections of the tumor which you removed from the posterior nares of a child. Its pedicle is composed of loose-meshed fibrous tissue, while the body of the growth from without inward is made up of an envelope of epithelium, a layer of soft fibrous tissue interspersed with elastic tissue, and a center composed of myxomatous tissue through which are scattered numerous round lymphoid cells. The tumor bears the general characteristics of a submucous myxoma. Yours truly, G. W. Schweinitz."

I have also had prepared a micro-photograph of the sections.

Discussion.

The President said that he had reported two cases of myxoma and had referred to them in Dr. Keating's *Cyclopædia of Diseases of Children*. "They occurred in the same family, in brother and sister; one was four years of age and the other six. In the one, the mother had noticed something protruding from the nose at one year of age, in the other the growth was probably congenital in origin. I removed both with the cold wire snare. These growths in children are not common. Morell Mackenzie in all his large practice never saw one under the age of sixteen years. Bartholini and other older writers reported cases of polypus in children, but in those days the diagnosis was not made as carefully as at present, and the distinction was not clearly drawn between these cases and simple hypertrophy."

Dr. Swain: This tumor has the appearance of a fibro-myxoma. I have seen such a case in a child eight years of age. I do not know the outcome of it, but think it may be of interest to mention it in this connection.

Paper.

A CASE OF FIBROSARCOMA OF THE RIGHT NASAL FOSSA, WITH UNUSUAL CLINICAL HISTORY.

By CHARLES H. KNIGHT, M.D.

THE following report is robbed of much of its value by the absence of post-mortem observations, yet the occurrence of several remarkable phenomena as the case progressed seem to make it worthy of more complete record. The specimen herewith exhibited occupied the naso-pharynx, but is no doubt a portion only of a neoplasm which had its origin within the nasal cavity. The patient came to the Throat Department of the Manhattan Eye and Ear Hospital in September, 1886, giving the following history:

P. D., aged forty-two, baker, married. Family history good. Patient has had no illness since childhood. About twelve years ago he received a violent blow on the bridge of the nose. The precise extent of the injury sustained is not known. For the last two years he has had more or less nasal obstruction and catarrhal discharge. The sense of smell has become impaired, and he has been annoyed by frequent sneezing and pretty constant frontal headache. His friends have noticed a marked change in his disposition. He has become irritable, surly, indisposed to work, and, contrary to his previous habit, has often taken liquor to excess. He has had no hæmorrhages until two months ago, when he expelled from the right anterior naris masses of bloody tissue, and at about the same time hawked out from the posterior nares a fleshy mass as large as a robin's egg. Two weeks ago the right eye became almost closed from an œdematous swelling of the lids, and there was considerable swelling and sensitiveness in the right infra-orbital region.

On examination, the right naris was found completely occluded by a soft, vascular, and very sensitive mass, somewhat resembling an old myxoma. It extended quite to the margin of the nostril, and with a rhinoscopic mirror a growth as large as a hickory-nut could be seen projecting into the naso-pharynx. No glandular enlargements could be discovered and there was no cachexia. An attempt to surround the growth with a loop of wire caused profuse hæmorrhage and extreme pain, upon which cocaine had no effect. A large piece was finally removed from the anterior portion of the tumor by means of a cold wire snare. The growth reproduced itself with astonishing rapidity, and when examined three days later it had almost regained its original dimensions. Under the microscope the appearances characteristic of fibrosarcoma were seen.

The patient then went to the New York Hospital, where Dr. Weir performed Chassaignac's operation (November 15th). An incisionwas made

across the nose at the level of the eyes downward and along the right labio-nasal junction to the left ala. The nasal bones were sawed through and the nose tilted to the left so as to expose the tumor. A quantity of soft growth was removed by means of the curette and the wire loop, when it was found that the neoplasm invaded the ethmoidal and sphenoidal cells, and that it could not safely be further followed. The cavity was packed with iodoform gauze after closing the external wound with sutures. The patient made a good recovery from the operation.*

Six weeks afterward (December 27th) he reappeared at the Manhattan Eye and Ear Hospital with his nostril blocked by a recurrence of the neoplasm, and complaining of amblyopia and impaired vision in his right eye. There was marked divergent strabismus. In the course of a week (January 11th) the sight in that eye was completely lost. He could not distinguish light from darkness. At this time an ophthalmoscopic examination by Dr. Roosa, Dr. Emerson, and others showed no change in the fundus. A week later (January 18th) the left eye began to lose its power. Still the ophthalmoscope discovered nothing abnormal. The process went on until in two weeks (February 1st) he became totally blind. There was no impairment of hearing and no muscular paralysis. The tumor then projected from the anterior naris, and the line of Weir's incision was breaking down. It filled the naso-pharynx to such an extent as to interfere seriously with speech and deglutition. Several attacks of wild delirium had occurred in which the patient had attempted to jump from the window. No rise of temperature was noted. Two weeks later (February 14th) the right eye and side of the face had disappeared beneath a fungoid mass of friable, vascular tissue, from which there was constant oozing of bloody serum. The fœtor was almost intolerable. The tumor had extended backward, so that speech was unintelligible and dysphagia was extreme. But little nourishment could be taken, and the patient had become much emaciated. He had various mental hallucinations and was at times violent. Most of the time he was in a condition of stupor.

Just a week from the time of the last visit (February 21st), about three months from the date of the operation and less than five months after he first came under observation, I received an urgent summons, as the patient was said to be bleeding to death. On reaching him, I found a most ghastly spectacle. It seems that during an attack of delirium a short time before he had torn off a portion of the tumor from his face, and had also passed his fingers into his mouth and dragged out an irregular mass, which was probably that part of the tumor filling the naso-pharynx. The rush of blood was so profuse as almost to suffocate him, and in a few moments he was thought to be dead. On my arrival, the bleeding had ceased, but the patient and the bed on which he lay were covered with blood. His breathing was rapid and shallow, his pulse was hardly perceptible, and he

* *N. Y. Med. Jour.*, March 12, 1889; also Case XXXV in Bosworth on *Diseases of the Nose and Throat*, p. 444.

was in a comatose condition, from which he could not be roused. Death occurred in about five hours. An autopsy was not permitted.

It would have been interesting to determine, if possible, the origin and distribution of this neoplasm. The early period at which indications of invasion of the cranial cavity appeared would suggest that the growth probably began in the sphenoidal or ethmoidal cells, thence extending both upward and downward. Such being the case, no operative interference could have been very promising, yet resection of the jaw would have given better access to the region affected, and might have permitted a more radical removal of the growth. On this point Weir thus expresses himself: "Irrespective of the cerebral extension, it would have been better in this case to do the usual partial resection of the jaw, according to Maisonneuve's suggestion, as this would not only have allowed a more thorough extirpation of the growth, but would have enabled one to detect and to treat early any recurrence."

In the words of Butlin, as found in his work on *The Operative Surgery of Malignant Disease*, "it is almost always necessary to remove at the same time some of the surrounding tissues—in some instances a very wide area—in order to prevent a local recurrence of the disease." In cases of this class it is often difficult to determine beforehand the exact origin and situation of the neoplasm. Hence it is doubly important, if any operation be undertaken, to select one which will give us the most ample opportunity for thorough inspection of the region. Partial and palliative operations should be discouraged, except in so far as they may be demanded for the removal of obstruction to swallowing or breathing, or for the arrest of hæmorrhage.

It is doubtless true that malignant tumors of the naso-pharynx and those of the nasal fossæ do not belong in precisely the same category; the former, being more accessible, may therefore be more completely engaged in the loop of an écraseur, or may come within the scope of less formidable procedures, such as electrolysis. But a large proportion of these cases come to us when the limitations of the neoplasm can no longer be clearly defined. We can not with certainty determine its attachments. The principle suggested by Butlin seems to apply as strongly to malignant disease here as elsewhere. If extirpation be attempted, we must be sure that *more* than the diseased tissue is included, in order to insure a successful result. We hear of many instances in which an operation was begun and soon abandoned because the growth was found to have passed the

line of safety. Recent literature gives us contradictory opinions as to the best method of attacking cases of this kind. At the close of the report of a case of naso-pharyngeal carcinoma in the *New York Medical Journal* for March 8, 1890, Dr. Sidney Allan Fox recommends "thorough removal, from time to time, of the growth with the post-nasal cutting forceps and wire snare." He maintains that in this way the removal may be radical (?), and, under cocaine, almost devoid of pain. He objects to the various capital operations, on the ground that they are dangerous and cause more or less mutilation.

On the other hand, in a memoir on The Diagnosis and Treatment of Malignant Tumors of the Nasal Fossæ, in the *Annales des mal. du larynx*, etc., March, 1890, and translated in the May number of the *Journal of Laryngology and Rhinology*, Dr. A. F. Plieque takes a very decided stand as to the use of forceps for ablation and the wire snare. In speaking of pedunculated malignant tumors, he says that they should never be removed in this manner, but always by an external incision. The latter opinion would seem to commend itself to our judgment. Many cases are on record in which the surgeon has endeavored to satisfy himself with milder measures and has finally been compelled to resort to the more radical method. Meanwhile valuable time has been lost, and the patient may be in poor condition to withstand the shock of the major operation. Moreover, the growth has been extending, thus diminishing the probability of thorough extirpation, and increasing that of local recurrence and generalization.

The conclusion seems, therefore, to be forced upon us that when we have determined to attempt the removal of a malignant tumor of the nose or naso-pharynx, *the extent or implantation of which is in doubt*, we should approach it by an external incision, removing enough of the bony structures to permit us to trace the neoplasm to its origin.

In connection with the case which has been reported, another question of interest presents itself. Did the traumatism received ten years before the beginning of symptoms bear a causative relation to subsequent developments? We are familiar with the influence of prolonged irritation in the ætiology of certain forms of malignant disease, as epithelioma of the lip and chimney-sweep's cancer, and it is the general custom to search for a history of injury in cases of carcinoma. Watson, in his work on *Diseases of the Nose*, page 282, says that recurring nasal fibromata show a tendency to

assume a sarcomatous type, and Bosworth (*Diseases of the Nose and Throat*, page 445) reports a case in which sarcoma developed after "polypi had been operated on rather harshly by means of forceps."

A similar case has been reported by Heymann.* A patient who had several times been operated on for nasal polyp finally appeared with a large intranasal tumor, which, on extirpation, proved to be a melanotic sarcoma, at many points undergoing carcinomatous degeneration. Cases of spontaneous transformation are rare. The observations of Michel, Hopman, and Schaeffer lack certain essentials. The only authentic case on record seems to be one reported by Bayer,† which was verified by microscopical examination and proved to be a villiform carcinoma implanted upon a simple mucous polyp. In looking over the forty-one cases collected by Bosworth, we find no light thrown upon this question. Yet it is one which from a medico-legal standpoint might be of some importance. For example, in my own case the patient himself and his friends were convinced that his nasal trouble was the direct consequence of a blow, and it was seriously proposed to have his assailant arrested. There is, however, a marked disproportion between the number of cases of malignant disease of the nasal fossæ and of injury to the nose. Hundreds of cases of nasal myxomata, requiring many operations and involving no small degree of traumatism, come yearly to our clinics, yet not more than a dozen cases can be found in which malignant degeneration of a benign growth can be suspected. It would seem, therefore, that we can not justly attribute to traumatism a causative agency; to repeat an opinion elsewhere expressed—it alone is not capable of creating malignancy.

Discussion.

Dr. Bosworth: The author takes the ground in this paper that the more radical operation is indicated in sarcoma of the naso-pharynx. In this I take issue with him, and regard the question as far from being settled. The only case of sarcoma of the naso-pharynx followed by recovery that I know of was one in which a severe operation could not be borne and the patient was treated with the mildest measures only. I reported this case to the American Medical Association several years ago. Butlin, in his monograph, says that sarcoma at first is a purely local disease. I hold that if we treat it as a local disease we are on safe ground. At the present time we can get at all parts of the nose without resorting to the operations mentioned; the old operations are no longer necessary.

* *Rev. mens. de laryngologie*, etc., No. 1, 1888, p. 24.

† *Rev. mens. de laryngologie*, etc., January, 1887, p. 17.

The best results have followed the plan of attacking the growth through the nose and, by careful manipulation, taking it away piecemeal. In my own experience, sarcoma is best treated in this way, using the cold wire snare. In carcinoma it does not matter what is done; my experience is that no form of treatment is of service.

Dr. MULHALL: I wish to place upon record a case bearing some resemblance to the one which Dr. Knight has just reported. It was one of small-celled sarcoma invading both nostrils. The case also has some bearing upon the question of the traumatic origin of these growths. The patient, a man about fifty years of age, had been injured by a fall upon the railroad, striking his nose upon a tie, about a year before the disease appeared, and he attributed the disease to the fall. He came to me with a mass of bleeding, fungous material projecting from both nostrils. Upon touching it, hæmorrhage was caused. I questioned if any operation would be of service, but I advised the removal piecemeal with the galvano-cautery and discountenanced any radical operation. After I succeeded in clearing one nostril, he gave up coming to me, and resorted to the use of morphine. He died in about four months with repeated hæmorrhages and inanition; the disease lasted about a year altogether.

Dr. BOSWORTH: The case is reported as one of fibro-sarcoma. Was there any change in the character of the tumor or its appearance corresponding with the occurrence of malignancy?

Dr. KNIGHT: While under my observation the neoplasm was fibro-sarcomatous. In speaking of the "radical operation," I refer not to Chassaignac's or Ollier's, but rather to one like Maisonneuve's, which exposes the region to its utmost limit. It may be true that carcinoma is better let alone. Is it not equally true in sarcoma that a policy of non-interference is more judicious than a prolonged series of nibblings at the surface of a growth which is steadily progressing beyond our reach?

Paper.

ADENOID TISSUE IN THE NASO-PHARYNX AND PHARYNX. PRELIMINARY REPORT.

BY H. L. SWAIN, M. D.

SEVERAL years ago, while studying the development and history of the lingual tonsil, many observations were made upon this variety of tissue as it presents itself in other portions of the pharynx, and it was the writer's purpose, at some future date, to continue the study of these latter portions of adenoid tissue, tracing the life history of the whole mass. To a few observations thus made in obedience to the above purpose the writer would ask your lenient

attention, hoping more to elicit thereby a discussion that shall prove profitable, rather than with any idea of adding anything of value to the knowledge already at hand in literature.

Since beginning the work in this direction much has been written on this tissue, and a great many points which interested the writer at the start have been definitely settled, but at the same time the field has broadened, and so, instead of busying ourselves with minute details, let us consider as a whole this ring of tissue which we are pleased to call adenoid, situated at the junction of the œsophagus at its dilated upper extremity and the mucous membrane of the mouth and nose. In so doing, however, we may not slight its principal component parts, but must consider them in their relations to each other and to the whole, and their joint or comparative life history.

Situated as is this ring of tissue, acting as a sort of bridge or other bond of connection between structures which are, on the one hand, originally developed from the entoderm of the embryo, and, on the other, with parts largely affected by ectodermoidal influences, it differs from the tissue in its immediate neighborhood quite considerably. It also has slight variations in the structure of its different parts—a difference in their life history—for some parts atrophy early, while others seem as active as ever even up to the middle of life, and yet all these differences are to be more than outnumbered by the variety of opinions as to the purpose of the adenoid tissue and its function in our economy.

To state in general what we know of the life history of these interesting parts, we might put it as follows: That way back, early in the uterine existence of man, the deposit of small cells underneath what then is the epithelium of the naso-pharynx and pharynx begins, accompanied or at times preceded by a slight furrowing of the membrane; very soon after this beginning comes the outwandering of the same cells through the epithelium. At some time later, the date varying in different portions as does that of the beginning, thickening takes place, and soon development of follicles. After a time, when extra-uterine life has begun, all parts grow on apparently alike until puberty, or toward adult life. Then activity seems to subside and a gradual retraction takes place. In general, we find already in late youth a beginning of atrophy in the pharynx tonsil, later on the faucial tonsil begins its retrogression, while way into adult life we find the lingual tonsil still unatrophied.

The apparent corollary of the foregoing is borne out in clinical

experience, for we have in young children the adenoid tissue in the naso-pharynx and faucial region more often affected by disease. In youth and early adult life the faucial tissue attracts our attention, while in a large majority of the cases which demand treatment the lingual tonsil seldom appears to be affected before the twenty-fifth year. Of course we have many exceptions, as acute affections of the pharynx tonsil in the adult, or enlargements of the lingual tonsil in the child. There is also, in general, the same order of development —that is, the pharynx tonsil begins certainly as early or earlier than the faucial, while both precede the full development of the lingual tonsil by quite a long period. In all, the formation of follicles follows at some considerable time interval after the deposit of small cells takes place, and in the case of the lingual tonsil it seems quite certain that pathological conditions favor the earlier development of the follicles, and that the more hypertrophied a portion becomes, the more follicles it contains. It proves to be also true that in the atrophy of the lingual tonsil the follicles first break down and disappear, and then a general diminution in the number of cells in the infiltrating mass under epithelium. This would seem to be also true of the other portions of this tissue in the pharynx, but, from individual investigation, the writer can not say, for this is one of the points aimed at in investigating this subject, and it is proposed to examine all portions of this tissue at the different periods in life, making comparative observations on the condition of the different parts.

In studying the development of the pharynx tonsil we have a great authority in Killian (5),* and the observations made by the writer entirely coincide with his, so I shall venture to quote him quite at length. He examined in all some sixty-five human embryos, and found that, while the real bursa pharyngea, according to Froriep, came as early as about the eleventh week, the first folds in the mucous membrane at the vault of the pharynx appeared at the beginning of the sixth month. These folds preceded any appearance of small cells, which begins usually toward the last of the sixth month. During the seventh and eighth months the folds assume a size sufficient to be discovered by the naked eye. Soon they assume the irregular details familiar from observation in the adult, the folds being often upright with occasional transverse. There is every variety of form and extent in the case of these changes, and the time of their appearance is far from regular, or the tonsil may be wanting en-

* Numbers refer to literature.

tirely at birth. The real adenoid tissue is formed by the mucous membrane taking up numerous round cells, until it becomes quite full and, by a rapid proliferation of these cells, grows considerably thicker. In the beginning the whole process confines itself to the posterior three quarters of the roof of the pharynx; later it spreads down on to the posterior wall of the pharynx. It is always thickest in the front region of the bursa—*i. e.*, just in front of the angle or curve formed by the roof with the posterior wall of the pharynx. Toward the end of the embryonal life these folds become thick protuberances and form deep furrows, of which the middle one appears to be the greater. At about this same time the follicles (Schmidt) (10) appear, although in certain cases they may not be found for some time after birth. These glands have no hollow spot, as in the case of the other collections of conglobate glands. Mucous glands are more abundant in the superior-lateral regions of the naso-pharynx.

After birth there is an apparent change of position of the pharynx tonsil which he states as follows: "The pharynx tonsil of man moves, between the sixth month of embryonic life and end of the second decennium, from the baso-sphenoidal to the baso-occipital region."

From his studies in comparative anatomy he concludes that in mammals the pharynx tonsil is not so constant as the faucial tonsil in its occurrence, but at least is as frequent as the lingual. In the lower forms of life, as in birds and reptiles, it is present in a well-developed form, and therefore, of all these collections of lymphatic tissue in the throat, is the oldest. Perhaps right here is a favorable opportunity of stating some observations by Beard (1), reported in an article entitled The Old Mouth and the New. In this he seems to present logical reasons for supposing that the old mouth—viz., the mouth which the lowest grades of animals, as the worm, possess, a direct continuation of the œsophagus to the surface—was by means of the hypophysis cerebri through the present infundibulum to the upper and back part of the head. Such having been the case, we have abundant reason for the fact of the frequent occurrence of the pharynx tonsil in the lower grades of animals, and in this latter the reason for the earlier development and activity of these tissues in man.

One other point of importance and I am done with the embryology of this part: "We must conclude that all three tonsils and the whole adenoid tissue at the beginning of the embryonic intestine are formed by the participation of the entoderm as motive principle,

and the mesoderm as the source of the adenoid infiltration. These parts must be looked upon as morphologically similar to the lymphatic organs of the whole intestinal canal."

We find in these statements of Killian much which is not in strict accordance with the hitherto accepted views, but I can heartily agree with him when he states that the real bursa pharyngea, pure and simple, as described by Tornwaldt and Luschka, has only a somewhat inconstant embryonal existence, and does not persist as such in the adult, or even long into childhood. It is not the dilated end of the hypophysis cerebri, or rather the canal from it to the pharynx. The true bursa exists before the tonsil proper begins, and is not to be confounded with the recessus pharyngeus medius of the adult, differing thus entirely from Schwabach (12) and Ganghofner (4). Poelchen (8) is perhaps the latest writer on this subject. He avoids all questions as to the bursa or recessus, but insists that the median groove exists all through life, and must necessarily do so, because this portion is attached so firmly to the base of the skull, between the insertions of the longus capitis muscles. In a patient where the side of the face had for surgical reasons been almost entirely removed, thus giving a clear view directly into the naso-pharynx, it was the only portion of the pharynx which did not participate in the motions of the act of swallowing, the pharynx walls always coming together from side to side.

Having thus considered the upper portion of the ring of adenoid tissue, as we come down on either side we have the lesser accumulations, such as the tube tonsils, the lateral column of the pharynx, and then we come to the faucial tonsils. Concerning the first two I have little to say, but a point that I have not yet sufficiently proved seems, however, to be probable from abundant clinical observation—viz., that, while the lateral columns may not possess any actual conglobate glands in any number, still, in common with the lingual tonsil, they preserve a later activity than the other parts, for we frequently find them hypertrophied together in late adult life.

Of faucial tonsils we know definitely that the beginning is as a fine groove, around which the infiltration accumulates, which goes on to the formation of deep sulci and the development of the organ so familiar to us all. In point of time the faucial tonsil seems to begin about the same time or perhaps a little later than the bursa pharyngea of Killian. According to Kölliker, the follicles of the conglobate gland are always nicely developed at birth, and he mentions the same as a fact in connection with the lingual tonsil. As

regards the latter, such is, from my own observations, not at all constantly the case, for, as stated in another place, many cases of young children were examined where not a follicle was to be found. The time seems to be quite uncertain, and as regards the first appearance of the infiltration, I have not had a chance to examine very young embryos. Suffice it to say that this same infiltration antedates the appearance of actual follicles by a considerable interval, and at some future time I hope, from human embryos now in my possession, to be able to speak more definitely. In animals the lingual tonsils begin at a decidedly later interval than the others in almost every instance.

Having observed these differences in the time and kind of formation in the various parts of the throat, we find a very beautiful connection with the observed facts in clinical history. The pharynx tonsil, the older organ in the history of animal life, is first affected in childhood by whatever of pathological changes take place in this tissue, and having fulfilled, as it were, its mission, even when not affected pathologically, it later atrophies, and this work is assumed by other parts. What is true of this portion seems later true of the faucial tonsil, while, to finish up with the work, we have, as the more persistent member of the group, the lingual tonsil, and perhaps the lateral pharyngeal columns. A later report will deal with this retrograde metamorphosis.

Evidently this tissue is not present in our bodies in the position which it occupies without fulfilling some definite purpose, and is it not possible to make some inference from this peculiar history of development and atrophy?

Killian states that the only function which these considerable surfaces, through which multitudes of leucocytes are constantly emigrating, seem to possess, is evident in the power which these cells have to destroy micro-organisms. Hence he would argue that the pharynx tonsil, being the first met by the incoming air, would play the greater part in ridding the system of these dangerous elements always present in the air about us. More of these little creatures are to be supposed to be present in the impure air that occurs in close rooms, and consequently there would be a greater demand put upon this organ in the animals subject to these conditions—*i. e.*, man and the house or domestic animals. This increase in demand for leucocytes would lead in the course of generations to a greater development of these tissues, and man and the animals referred to would come to possess larger adenoid collections, a fact borne out by his

observations in comparative anatomy, excepting, perhaps, that rodents, save the rabbit, do not appear to be blessed with much of any adenoid tissue.

The converse was equally well borne out by his observations, for in those animals where the nose is long and very complicated, and the air does not come directly in contact with the pharynx tonsil, as in man, no such eminent demand would be made on this tonsil, and so in succeeding generations we would see it disappear as is the case with many mammals. His opinion is somewhat influenced, if we may be allowed the inference, by the interesting account which Metschnikoff (6, 7) gives of the warfare waged by the leucocytes or their analogue in the *Sprosspilzenkrankheit* of the *Daphnidæ*, and against the erysipelas micrococci. He observed unquestionable examples of the antagonism existing in these cases, and so the inference was fair that a like animosity exists against other micro-organisms.

Spicer (13) believes, in common with H. Fox, that the pharynx tonsil, as also the other adenoid tissue, acts as a preventive against too great a use of fluid, in that, in the pause between each two acts of swallowing, they absorb the fluid of mucous membrane of the mouth, as also certain parts of the food while they are passing by; and finally, as a place of nourishment for the leucocytes, they take part in production of blood.

In common with Schmidt and Stöhr (14), they all agree that the collection of the leucocytes here must have some significance in regard to the blood; in short, adenoid tissue is a sort of blood-producing organ; but Killian rather puts this feature in the background and thinks the function is more in the way of protection against deleterious matter.

Davidoff (3), in speaking of the leucocytes in the intestinal epithelium, puts another interpretation upon their presence in this situation, and, far from supposing them to be fighting micro-organisms, he conceives that they are the carriers of some of the digested food through the epithelium into the intestine. Thus he believes in direct opposition to Stöhr, who first drew attention to the immense immigration into the throat. Stöhr, while he says but little about the fate of the leucocytes after they leave the epithelium, distinctly believes in there being some relationship existing between the demand of the rest of the body for leucocytes and the number present in adenoid tissue, for he mentions an almost complete lack of cell immigration in several cases of persistent formation of pus, pyo-

pneumothorax, and a considerable lessening of the normal number in a case of leucæmia.

Whichever of these theories we adopt, we can not escape from certain difficulties in trying to explain certain observed phenomena. For example, if the sole purpose of the adenoid tissue of the throat is to furnish leucocytes, which shall protect us from the invading host of rapacious micro-organisms, then we may safely conclude that for those who breathe through the nose the pharynx tonsil is really the most valuable in this particular. Is it not strange, then, that this should be the first to atrophy, when it is the one most needed? To be sure there are the other parts still left, but they can not get at the inspired air. Or must we suppose that the pharynx tonsil takes care of the air, while the faucial and lingual do duty in fighting the organisms present in the secretions of the mouth and pharynx? This takes place in the youth of the individual, and later in the adult there is not such an urgent necessity for such protection in that other organs may do the work, or the system be more capable of resisting. Certainly if the above be the case, we must not be hasty in removing enlargements of these organs unless we find them to be producing disease of other parts, for one can not have too many leucocytes at his command. And yet while we find these little inconsistencies, surely we must almost *a priori* conclude that the leucocytes must exercise some protective influence, and that an active one, for how could we otherwise so often escape infection? Surely nothing would seem more favorable to the ingress of organisms in the system than the tonsils, which present in the lacunæ the most convenient of resting places for microbes, and then in the openings which unquestionably exist in the epithelium we have an almost open door for the entrance of the little micrococcus. Granted that the majority of the organisms referred to are entirely innocuous, still some are not, and were it not for some active interference, we must often become infected under the conditions just quoted. So I think in the light of present knowledge we must give Killian's view a decided credence; but in view of the fact that the immensely larger number of the leucocytes present in the tissue do not ever get to the surface, and remembering the observations of Stöhr, which I can in part second, as regards the diminution in the number of cells in adenoid tissue under strong demand for white blood-corpuscles by the rest of the system, we must also look upon the tissue as strictly lymphatic tissue—a blood-producing organ. And in the light of this view we can more easily explain the atrophy. Therefore the function is twofold.

As regards the theory of soaking up the fluid in the throat, it seems to me to be quite a secondary object, if it exists at all.

The question of retrograde metamorphoses or pathological changes we must leave for the report of future observation, which I hope to make. Meanwhile let me simply mention again the observation of Poelchen, which he cites to explain the very frequent appearance of and persistence of diseased conditions of the secretion high up in the naso-pharynx. The close union of the apex of the recessus medius by fibro-cartilaginous bands to the base of skull between the muscles rectus capitis gives an immobility to the parts that tends to the retention of secretions, and that the more as by the movement of the side walls toward each other it is into this recessus that the secretions are poured as into a conduit. The deduction is to supply what nature does not afford, and especially to be observant of adhesions or thickenings, which may hinder the easy downward flow from the recessus.

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Discussion.

Dr. Bosworth: Dr. Swain's paper is very interesting and timely. Just now considerable attention is directed to the lymphatic tissue in the vault of the pharynx, the base of the tongue, and in the fauces. What are its functions? what its pathological relations? but, prominently, what constitutes a pathological condition of this structure? I confess that I do not look with much favor upon the speculations which have been advanced as to the function of this tissue. For instance, when Scanes Spicer says that it is placed there to drink up superfluous fluid, it does not, in my opinion, rise to the dignity of a physiological theory; nor, when Killian says it is there in order to destroy micro-organisms, do I regard it as much more rational. It is very evident that it can act upon only a very small part of the inspired air, and can exercise only a very slight effect in this way. In diseased conditions it might, on the contrary, act as traps for pathogenic micro-organisms, and afford a suitable culture ground, as in diphtheria. As a matter of fact, many of the diseases of young children are contracted in this way, such as scarlet fever, measles, diphtheria, follicular amygdalitis, etc. All of these are evidently due in many cases to the fact that these disease germs are introduced and developed there. Again, in confirmation of Killian's theory, may it not be that this function of destroying organisms is itself destroyed by the diseased condition of the glands which arrests their function? Another important question to be solved is, What constitutes a diseased condition of the adenoid tissue in the vault of the pharynx? Are adenoid growths abnormal? Are the small pearly bodies so often seen there evidence of disease? Again, the manifestations of a catarrhal process in this region are different at different ages; up to fifteen or twenty years of age this region is the most frequent source of a catarrhal discharge; from twenty to forty, intranasal disease is the rule; while from forty to sixty it is back again in the naso-pharynx. In children the disorder is due to hypertrophy of the lymphatic structures in the vault of the pharynx; in adult life the adenoid tissue is shrunken up, and atrophic changes occur. Another problem is, Where does all the mucous secretion come from in cases of naso-pharyngeal catarrh? Adenoid tissue does not secrete mucus. What is the possible source of the discharge? It is possible

that the pain may be due to the shrinkage of the adenoid tissue which imprisons the terminal fibers of nerves; but where does all the secretion come from? I do not believe Schwalbach's theory; it is not reasonable, and I can not accept it. At the opening of a recent meeting of the British Laryngological Association, Mackenzie Kennedy said that if any one could tell us how to cure naso-pharyngeal catarrh he would confer the greatest benefit upon laryngology. We treat it, it is true, after a fashion, but, after all, do we know anything about it?

Dr Langmaid: I would ask Dr. Swain to illustrate his remarks upon the blackboard. What is meant by the statement that when there is a demand by the blood for more leucocytes there is a diminution of adenoid tissue?

Dr. Bosworth: I should like to ask, also, if the author based the remark that adenoid-tissue function was to make blood upon any personal observation or experiment?

Dr. Swain: In answer to Dr. Langmaid, the only observations I know of are those made by Stöhr and two made by myself. Stöhr found that in a case of pyo-pneumothorax, upon examination of the throat, there were hardly any follicles in the adenoid tissue; and, secondly, that the number of leucocytes lying in the epithelium was very much less. In a case of leucocythæmia he made similar observations, although the appearances were not so well marked. My own observations were in a case of bone tuberculosis, and in one of pure pulmonary tuberculosis. I found in the lingual tonsil there was great diminution and atrophy of gland tissue at the base of the tongue. The conglobate glands were very much atrophied.

With regard to the point raised by Dr. Bosworth concerning the source of the great quantity of secretion, in the observations made by Killian and in my own there was no connection found between the amount of increase in the adenoid tissue and that in the racemose glands, increase in the latter not always following the same in the former. As to the explanation referred to by Dr. Bosworth, why it was necessary for the lymphoid tissue to go through this process of diminution and atrophy, I can not say anything, except that it *is* necessary. We see it so much in our cases that we must believe it to be the inevitable course of adenoid tissue in this situation to undergo this degeneration and atrophy. I may not have made it very clear in my paper, but I think the point made by Killian a very important one.

Paper.

SUPPLEMENTAL REPORT ON CARTILAGINOUS TUMORS OF THE LARYNX AND WARTY GROWTHS IN THE NOSE.

By E. FLETCHER INGALS, A. M., M. D.

AT the meeting of the American Laryngological Association, held in Washington, September, 1888, I reported the case of a young man suffering from a cartilaginous tumor, just beneath the vocal cords, which grew from the lower portion of the thyreoid cartilage. This growth I had been treating by the local application of chromic acid in full strength.

At the time the growth seemed to have been practically cured, but the following month the patient again consulted me, when I found a slight thickening of the right half of the base of the tumor. I again cauterized the growth with chromic acid, and subsequently, on one or two occasions, similar applications were made, with the effect of completely destroying it. During the past year there has been no recurrence, and now the patient may fairly be pronounced cured. In this case the growth measured originally one centimetre in diameter by seven centimetres in thickness. Internal remedies and local applications of various kinds had done no good, and finally there seemed no way of removing it, excepting by laryngotomy, until I tried the plan of gradual destruction by chromic acid. Altogether twelve or thirteen applications of the acid were made, a mass of the fused acid about as large as a millet seed being used each time. Owing to the patient's business, intervals of from three weeks to several months intervened between the various cauterizations. At present the parts appear normal; even the mucous membrane shows no cicatrix, and the thickening has entirely disappeared. The acid seems to have caused absorption rather than destruction. Intense congestion followed each cauterization, but I never observed ulceration of the parts after the applications. However, I seldom saw the patient for several weeks after cauterization. From the final result in this case I can strongly urge a faithful and long-continued trial of this method of treatment in laryngeal growths which can not be thoroughly eradicated by forceps.

At the last meeting of this association I reported a case of warty growths in the nose which I had cauterized from time to time with chromic acid, nitric acid, nitrate of silver, or the galvano-cautery

I had hopes of curing the case by these agents, but the warts continued to return. For about two months after my report was written I either applied chromic acid or used the galvano-cautery about once a week for the destruction of all warty growths that appeared. On the 7th of August, 1889, I applied to the growth the tincture of thuja occidentalis and gave to the patient the same preparation, which he was directed to apply twice daily with a pledget of cotton, which was to remain for twenty minutes. At the same time he was told to take internally teaspoonful doses of the remedy three times each day. He made the local applications faithfully and for a few days took the medicine internally with considerable regularity, but afterward he limited the treatment to local applications. During the next ten weeks I saw the patient eight or ten times and made six or eight applications of chromic acid to small warts as they appeared. At the end of this time I find it noted in the record that there was no appearance of warty growths. The patient still used the thuja occidentalis locally, though not with great regularity. Subsequently the mucous membrane of that side had a tendency to become dry, for which it was treated from time to time with various remedies. About a month after the final disappearance of the warts the patient was given a spray of two grains of carbolic acid and two grains of camphor to the ounce of liquid albolene, which he used for a short time. It is now seven months since the last of the warty growths were destroyed and none have returned. What the influence of the thuja occidentalis has been upon this case it is impossible to say; but, from its time-honored reputation for curing warty growths and from the fact that previous remedies had failed, I think it fair to give it a portion of the credit, though doubtless the occasional use of chromic acid had something to do with the result; however, during the treatment it was very apparent that the growths did not reappear as quickly, and that they enlarged much more slowly after the thuja occidentalis had been in use a short time.

Discussion.

Dr. Bosworth: In connection with this subject I will refer casually to a case I saw four months ago. It was a broad papilloma upon the tongue and palatal arches in a child three months of age. I applied thuja occidentalis, but without any effect whatever. The growth subsequently disappeared under the use of glacial acetic acid. I thought this case might be interesting as showing the failure of thuja. These growths in the nose are quite frequent. I have seen half a dozen cases within the last year; they are probably usually mistaken for small polypi. In my

cases I snared them off and cauterized the base with chromic acid. My own experience has failed to show me where the reputation of thuja has been maintained.

Dr. JARVIS: I have had some experience in connection with these growths, especially in their treatment with chromic acid, when occurring in the larynx. I was perhaps the first to point out the fact that this agent would completely remove the growth as well as prevent its recurrence. Hering afterward came out in its favor. There is one point about it that should be mentioned—namely, the advantage that it does not reach beyond the papillomatous tissue in its effects; it furthermore does no harm to the healthy mucous membrane in the immediate vicinity of the growth. This is due to the diversity of the tissue. Cartilage is not affected by small applications of the acid. It acts by progressive superficial sphacelation. The effect is regulated by the quantity used; if small, no danger can follow. I have seen only two cases of nasal papilloma. One I should not call a case of true papilloma. It was in a boy about sixteen and was a modified polypus—a polypoid growth, in fact. It had not the raspberry-like, irregular surface, but it had been altered by previous applications. I called it a teleangeiectatic polypus. It bled easily. The other case I at first considered one of true papilloma, but afterward came to the conclusion that it was a case of epithelioma, as I think many of them are. It was not changed by long treatment, and extreme radical measures had no permanent effect upon it.

Dr. MULHALL: There seems to be some confusion in this discussion between warty growths and papillomata. I recall a paper by Hopmann, who professed to have seen a hundred and twenty cases of warty growths in the nose. I wondered why I had never seen a case. A patient applied to me a short time ago for treatment for "warts" in his nose, which I found to be papilloma, such as we find in the larynx. It grew from the anterior portion of the middle turbinated bone, and looked exactly like a small bunch of grapes. I saw the case just before I left, and operated upon it. It was readily removed, and the operation afforded much relief to the breathing. I desire to place this on record as the first case I have seen of papilloma of the nose. (The speaker presented a specimen of nasal papilloma.)

The PRESIDENT inquired of Dr. Mulhall if the growth in his case was large and if it might not have been a portion of the erectile body.

Dr. MULHALL: The growth was large and could be withdrawn from the nose partially, but again retracted; it was somewhat elastic. The middle and upper turbinated bodies were free.

The PRESIDENT: I have seen prolapse of the mucous membrane from the anterior portion of the turbinated body which could be withdrawn from the nose in the manner just mentioned, and which had been mistaken for polypus.

Dr. MACCOY: I can recall three cases of warty growths, all growing in the vestibule, having the appearance already described. I removed

them with the galvano-cautery. There was some tendency to return, but they were all ultimately cured.

Dr. DELAVAN: One of the interesting features of this discussion is the general consensus of opinion as to the rarity of the case. I was much surprised at the statements of Hopmann, and think that there must be something peculiar in the cases coming to him, as in my experience papilloma in this situation is a rare disease.

The PRESIDENT: I fully agree with Dr. Bosworth that these papillomatous tumors are likely to grow just within the vestibule, and are more common than is generally supposed; but growing further within the nose they are rare. I can recall only two cases of this kind in my experience. I think the remark of Dr. Jarvis very well founded and appropriate. Where we find a papillary growth with a broad base and a tendency to bleed we should be on the lookout for carcinoma. I think that Hopmann mistook for papilloma the changes that occur in the ordinary transition from the secondary to the tertiary form of chronic rhinitis. Cross-sections of these bodies under the microscope resemble papillomatous tissue, whereas they actually consist of turbinated erectile tissue. I think that Hopmann, in some cases at least, mistook these outgrowths for papillomata. I desire to call attention to an important clinical point: Sometimes patients complain for a long time of a sense of fulness of the nostril and other symptoms of hypertrophic catarrh, and after a while expel little pieces of flesh, as they term them, from the nose. Afterward they find that they can breathe better, and that the obstruction in the nose has disappeared. The reason is, that under the influence of the atrophic process these little bodies are separated and slough off. It does not mean that the patient has gotten well, but simply that the hypertrophic process has gone on to atrophy. Under the microscope, sections of these bodies resemble papillomatous growths in structure, and may be mistaken for them, while they are really the results of hypertrophic degeneration.

Dr. INGALS: I think that this mulberry-like appearance of the turbinated body is probably the reason that Hopmann, and probably some others, have found so many so-called cases of papilloma of the nose, as a mistake might easily be made. I have often seen this condition, which is not that of a true papilloma, but I have never seen but the one reported in which the growths had the appearance of warts. In this particular case the growths, which recurred many times, did not resemble papillomatous tumors in the larynx in any way. They grew first from the septum, and afterward from the turbinated body, and had all the appearance of warty growths as we commonly see them upon the hands.

As to the thuja occidentalis: I did not wish to try to prove that it had any special value, though this has been alleged for it; but I must say that the patient did much better after using it than he had been doing

before. It is possible that it may make some difference whether a fresh tincture is used or not. The preparation I employed was prepared at the time from the fresh leaves of the arbor vitæ.

Paper.

HOARSENESS AND LOSS OF VOICE CAUSED BY WRONG VOCAL METHOD.

By S. W. LANGMAID, M. D.

SUCH a case as the following often presents itself in my own practice, as I suppose it does in the practice of all who see many singers' throats.

A young person, generally a female, complains of hoarseness, of difficulty in producing such tones as still remain to the singing voice, of a constant tired feeling in the region of the larynx, and of aching or pain there after singing.

The history is generally as follows: The patient is a student of vocal music. Before commencing the study of vocalization she sang freely, thoughtless of her manner of doing so, with no sense of fatigue, but, on the contrary, with a feeling of physical enjoyment; in fact, as a child of musical aptitude and a naturally good singing voice always sings.

Very soon after beginning to receive instruction she began to experience some of the above-mentioned symptoms, and the highest notes of the voice were produced with increasing effort. After a time these high notes were lost, and at last the speaking as well as the singing voice became hoarse. To such a recital is added the remark that before taking singing lessons there had never been any throat affection or hoarseness.

The examination of the throat reveals perhaps a moderate naso-pharyngitis and a catarrhal laryngitis, and, upon attempted vocalization, one or both vocal bands are seen to be paretic. The closure of the cartilaginous and ligamentous glottis is imperfect and there is defective tension.

Now to the patient as well as to the physician such a history and such appearances reveal nothing more than a catarrhal affection of the mucous membrane, and consequent paresis of the laryngeal muscles, caused by hostile climate. Especially would this be likely if the patient had formerly resided in an inland region and was pursuing her studies in a seaboard or lake city. Of course, under any

circumstances, the first command given by the physician would be entire rest of the singing voice and as much as might be possible of the speaking voice also.

The ordinary treatment for the catarrhal condition would be instituted, and, should the paresis not disappear, faradization and strychnine would probably assist the action of the vocal bands and help to restore the quality and capability of the voice.

Such a result will naturally lead to mutual congratulations. But should the cure prove to be short-lived, and the same treatment be required almost as soon as the lessons or practice are resumed, the physician and patient may well ask if a disease which yields so readily to rest and almost routine treatment in an otherwise healthy young person has not some causative factor besides atmospheric conditions.

The natural inference would be that singing had something to do with it. Now singing, properly performed, never injured a healthy throat. I believe, on the contrary, that declamatory exercises and singing are not only restorative to throats which have congestive tendencies, but are also most efficient in preventing catarrhal inflammations. If this is true, and I think no one will dispute it, the decision will not be that singing must be abandoned, but inquiry must be made with regard to the manner of using the voice.

Let it not be said that this is not within the province of the medical adviser. Granted that the laryngologist is not expected to teach vocalization, it is, nevertheless, the fact that the anatomy and physiology of the vocal organs are his daily study.

Most of us are fully competent to detect a wrong physiological procedure by inference, if not by the result which special training or a musically appreciative ear instantly stamps as vocally wrong—that is, physiologically wrong. To abandon the practice of singing may entail in our patients great individual deprivation, as well as loss to a community, small or large, as the case may be.

The medical adviser in the case described above will not be able to prevent the return of the morbid conditions except by determining the fact that wrong use of the voice is probably the cause of its deterioration.

And now it may be properly asked of me to show how the voice has been improperly trained or used.

First of all, let me say that the defects in vocal production are many, and the various wrong ways of singing are almost numberless. The peculiar morbid conditions of the throat which I have described

are most frequently caused by the instruction which is given by some teachers, and not infrequently inculcated by treatises on singing, that the tongue should be forced to lie flat in the mouth during vocalization.

If I should assert that this was wrong, I should simply answer one dogmatic assertion by another. Therefore we must examine the mechanism of the natural emission of tone, and contrast this with what we have found will produce the diseased condition which we have described.

A different position of the laryngeal parts is demanded for each note of the scale. In a previous paper I have said that the muscular arrangements of the larynx are capable of adjusting the position of the larynx for every note of the scale independently of the action of the breath. In order that these adjustments may take place rapidly, there must be no hindering, opposing action of antagonistic muscles.

The theory which induces the teacher to insist upon the depression of the tongue is that the cavities of the mouth and pharynx are thereby enlarged, and the corollary is that the larger these cavities are the larger the tone is. Not only is this deduction erroneous, but, if true, the method employed would be the least suited to gain the desired result.

The attempt to depress the tongue necessarily causes tension of the posterior and especially of the anterior pillars of the pharynx, and the isthmus faucium is thereby narrowed. Whatever may be the explanation, the fact remains that such instruction is given by many teachers, and the effects are as pictured above.

Forced flattening of the tongue prevents the necessary free movement of that organ as well as of the jaw and the velum palati. The epiglottis is bent backward and the larynx is driven down and held in a constrained position.

We know that constant alteration in the shape of the mouth takes place during singing, because its shape varies for every different vowel sound.

We all witness, many times each day, that the base of the tongue changes its position or form with each different vowel sound which the patient is asked to produce during the ordinary laryngoscopic examination.

To insist that the root of the tongue should remain flat in singing the vowels *e* and *i* (Italian) is demanding that opposing, hindering muscular efforts shall be put into action; moreover, the natural,

frank emission of these vowels is impossible. To *hold* the tongue flat for such vowels as are *naturally* produced with a lower position of the tongue and larynx, *a* and *u* (Italian) is to prevent the free action of the muscular adjustments which are necessary for every successive note of the scale.

So far I have spoken only of the effects of this evil instruction upon the pharynx and the laryngeal movement *en masse*. The constrained and unnatural positions into which the pharyngeal muscles are forced will largely account for the catarrhal processes, but the greatest injury is produced within the larynx itself.

I have said that a different adjustment of the laryngeal parts is demanded for each note of the scale. That a variation in the action of *intrinsic* muscles is necessary is proved by the changed appearance of the glottis with every group of notes which constitute the so-called registers. At a certain note of the scale, differing with the character of the voice—soprano, contralto, tenor, etc.—a well-marked change in the shape of the glottis is perceived by the mirror.* The cartilaginous glottis is closed and the vibration is confined to the ligamentous portion. Again, the shape of the ligamentous glottis changes as the scale is sung upward. Now, all these changes in the shape of the glottis are produced by changing muscular action.

If we consider how rapidly these changes occur we must admit that no restraining force, by opposing muscular action, can be permitted. Add to this the variation in the longitudinal tension of the bands and we need say nothing further with regard to the freedom of action which is demanded for all laryngeal movements.

The fatigue of the intrinsic laryngeal muscles which results in a real paresis arises from the unnaturally forced endeavor of these muscles, together with their assisting extrinsic ones, to form the glottis into the proper shape for the production of the different tones of the scale; for, if the position of the larynx is not the natural one for the production of any note, the glottis-shaping muscles can not perform their function unassisted, and the help of the increased wind-blast is called for.

The contest can not be carried on forever, and sooner or later the tired muscles are incapable of the required contracting force, and tension, as well as adducting power, is lost. The cartilaginous and the ligamentous glottis of one or both sides remain inactive, and congestion of the relaxed bands and an open glottis result. I might stop

* Although this change is not so exact as would appear from the foregoing statement, it is sufficiently so for the argument.

at this point, but I can not refrain from the brief citation of a few cases which seem to illustrate my argument.

In two cases I have seen extravasation of blood under the mucous membrane of the vocal band—a condition which I venture to call the spirit level form of hæmorrhage, for the globule of blood during phonation changes its position as the drop of air in the level does at any departure from the horizontal. I first saw this extravasation in the vocal band of a young lady who was being taught to force the tongue flat while singing. I saw the same condition in the vocal band of a favorite actor, whose wonderful character acting has astonished and delighted the public for a few years past. The rôle in which he has been so successful demands a double impersonation—the constant use of a peculiar low voice, quickly alternating with a quite different higher voice of contrasted timbre. The extraordinary low voice is evidently produced by forcing down the larynx, while the result is great vocal fatigue and, certainly on one occasion, has been hæmorrhage into the substance of the vocal band.

Case of a Young Tenor.—A few months ago a young tenor desired my advice for exactly the conditions which have been described in the beginning of this paper. It so happened that for two or three years I had listened to his singing and had had abundant opportunity to know that his voice was a true tenor of large compass and of pleasing quality, but for some months past I had noticed that it had lost much of its brilliancy and purity, and that the upper tones were sung as if with unusual effort. Upon inquiry, I found that he had been studying with a teacher who had insisted that all the different vowel sounds should be sung with flat tongue and low larynx. Abstinence from singing and the complete abandonment of the vicious instruction, together with the usual treatment for the catarrhal inflammation, quickly restored the natural quality and compass of the voice.

What has been so far said is the result of my own observation and belief. It is agreeable to find corroboration in the writings of teachers and physicians. With your indulgence I will make but two quotations which seem too apposite to be omitted.

Patton says:* "But the aim of all vocal practice consists in establishing perfectly normal relations between the motor power and the cords. Now, this result is only to be reached by the absence of all undue efforts; and, whereas certain vocal theorists, who rely wholly for success on various muscular movements, may occasionally produce some local benefit, yet in general they impart to the pupil

* *The Art of Voice Production*, New York, 1882, pp. 84 *et seq.*

an idea that singing is laborious work, and the latter seldom reaches, judging from experience and various instances, the ease of tone emission which is a charm both for the singer and the listener. Therefore, would it not seem far better, as a general rule, that the vocal scholar were told to think as little as possible about his tongue, for instance, excepting to let it alone and at rest, relying for vocal effect exclusively on the correct breath action? . . . Let the vocal student learn to open his mouth with the utmost ease. Let him learn to drop the lower jaw in uttering a tone with the same absolutely unconscious ease, even as the eyelids drop apart, and let him in this natural way develop any other set of muscles called in play for vocal purposes in the most gentle manner, ever remembering how quietly Nature performs all her normal functions. I desire to impress it on the minds of vocal scholars that any abnormal and strained muscular gymnastics for vocal purposes—as, for instance, the pulling up and down of the larynx as a whole, apart from its natural movements, as in swallowing, etc.—must be pernicious, because all such movements are unnatural in singing. The muscles involving the production of the voice are *instinctively* set to work, and their wonderful adjustment far surpasses all human conception and ingenuity."

Sir Morell Mackenzie* writes:

"If the master persists in making the pupil sing in a way that is *felt* to be a severe strain, if every lesson is followed by distressing fatigue of the laryngeal muscles, pain in the throat, or huskiness of the voice, then I say, whatever be the authority of your instructor, do not listen to him, but rather heed the warning that is given you by your overtaxed organs."

I am aware that the picture I have drawn exhibits fatigue of the vocal organs and is to be treated as such, but it is not fatigue caused by the legitimate or necessary use of the voice, which may occur to the best singers from the exigencies of the exercise of their profession. It is a fatigue which occurs from wrong vocal training, and has ruined many a good voice.

The pupil is ignorant and trusting, and the teacher conscientiously inculcates a method which, so far as I know, always produces injury. The physician must heal and restore the injured organ, and, if possible, prevent recurrence of the diseased condition. It seems to me that he should warn the pupil that unnatural, unphysiological processes will render his treatment abortive.

* *Hygiene of the Vocal Organs*, p. 103.

Discussion.

Dr. DELAVAN: It will be generally conceded that no higher authority than Dr. Langmaid could discuss the questions presented in this paper. To it we can only add the testimony of our own experience. From the statements of noted singers who have been trained under the system which the reader of the paper describes, as well as from my own personal experience in practical vocalization, I am able to confirm the views which he has expressed. Not infrequently cases have come to me complaining of some laryngeal difficulty in which a diagnosis from simple inspection of the larynx was impossible, and a correct solution of the matter only arrived at by a careful study of the vocal methods of the patient and the discovery of its defects. In many instances faulty voice-production will be found to be the true explanation of an otherwise inexplicable difficulty. Of course it is of great importance for us to understand our cases in order that we may properly treat them, and, understanding them, to see that the treatment employed be not confined to local applications, but that the faulty methods of vocalization be corrected under the training of a competent teacher. Again, the services of the vocal instructor are of great value in the treatment of certain chronic conditions of laryngeal disease. I am in the habit of referring patients to a skillful teacher for the purpose of obtaining systematic exercise of the laryngeal muscles, just as in appropriate cases the surgeon resorts to passive motion. It is to be hoped that Dr. Langmaid will continue to offer us such studies as this through his work. Aided by that of Dr. French, we should be in a position to recognize and successfully treat many cases which now are wholly misunderstood.

Dr. HINKEL: I am reminded by the paper of a class of cases in which I have taken much interest—cases in which there is vocal disability due to some structural defect in the nasal passages or naso-pharynx. Such patients suffer injury to the throat and voice from the demands made upon the vocal organ beyond what is customary in speech, even though there be nothing faulty in the vocal method. It is of importance to recognize this defective condition, for many teachers and pupils are puzzled to account for the failure of promising voices in which the defect is due to a lack of co-ordination, as it were, between the primary tone-organ and the resonating apparatus. The removal of a septal ridge or of adenoids not infrequently restores the power and quality to the voice. I recall a tenor who gained a minor third in his compass after the removal of a septal ridge from which he had suffered no inflammation or obstruction of which he was aware.

Dr. MULHALL: The matter which the last speaker refers to is hardly germain to the subject of the paper. If we were to go into the discussion of the effects of abnormities of the air-passages upon the formation of tone we should hardly get through with it before our final adjournment. There is one point, however, that I would like to have discussed. It is

the so-called "abdominal" method of singing or managing the voice. I wish that every singing-master could have this paper of Dr. Langmaid's put into his hand. I agree with the essayist that any singer who is *conscious of effort above the clavicle* while singing is using a wrong method. I wish to speak of the abdominal method. We notice with what ease the tenor of the Italian opera produces the high notes without even flushing his face, and he can sing the whole evening without apparent fatigue, because he has had the benefit of proper training in the formation of tones and uses his abdominal muscles in singing. I recall the case of a theological student who found in preaching that he got tired in half an hour and lost his voice. I found that he was using his sterno-cleido-mastoid and other neck muscles in producing his pathetic effects. I instructed him to concentrate his mind upon the action of his abdominal muscles in public speaking and to forget his throat. He practiced this and taught himself this method that I have described, and found that he could preach for two hours at a time without any hoarseness whatever. The method of using the voice by which the very walls of the theatre are made to vibrate with the volume of sound is familiar to those who attend Italian opera; the effects are produced by the action of the abdominal muscles and the diaphragm. Many singing-teachers in this country apparently do not know this. The teachers in the theological seminaries do not know how to instruct students in the proper use of these muscles. I might mention a case which may not be exactly germain to the subject. A prominent teacher in St. Louis sent one of her pupils to me because she could not get beyond a certain note in the scale. Upon examination, I found a very peculiar condition. As the voice rises in the scale the epiglottis usually becomes more and more erect, becoming vertical with the high notes. This young lady had enlarged papillæ at the base of the tongue, which were so large as to interfere with the epiglottis and prevent it from erecting itself to form the notes. I removed these growths with a wire snare, and it added two notes to her upper register and gave a really brilliant result.

Dr. MACKENZIE: Faulty training must be recognized as a cause of vocal defects, and in overcoming them much time and patience are needed. I agree with Dr. Mulhall in regard to bridling the tongue. The isolation of the naso pharynx is due to the rising of the dorsum of the tongue to meet the descending walls of the pharynx and uvula. The motions of the tongue have a great deal to do with the formation of tones, and anything encroaching upon the naso pharynx or the tongue is an important factor in the destruction of the mechanism of voice. The instruction given by singing-teachers to keep the tongue upon the floor of the mouth is not physiological. It checks and cripples the movements of the throat muscles, the tensor palati, and the middle constrictor of the pharynx; even the buccinators are under restraint. It is the opinion of Meyer, of Zurich, that the middle constrictor of the pharynx is not concerned in swallowing, but is concerned in speech and in singing, there-

fore a very important agent in vocalization. In the production of certain notes there is a pushing forward of the middle fibers of this muscle toward the palate. It has been shown conclusively that this bulging of the middle constrictor muscle, upon which the soft palate rests, is of special use, as together they produce a complete isolation of the mouth and nose in the production of certain notes. With regard to Dr. Hinkel's observation, the fact is already well known. With regard to Dr. Mulhall's remarks, it was Mandl who pointed out in his writings with more clearness than the others the importance of the abdominal method. In the Italian school great attention is paid to this method of developing the abdominal muscles. The suggestion of Dr. Mulhall is a very proper one, and should be put in operation in our daily work; by it we may succeed in curing cases that otherwise we could not benefit.

Dr. LANGMAID: I feel gratified by the discussion which has been given to the subject, which I have had under consideration for a long time. I have said in my paper that there are wrong vocal methods, and I have been asked to formulate the right vocal method. I know many wrong ones from the effects that are produced by them; what is the right one I hope to be able to state at some future time. With regard to the class of singers referred to, who are conscious of effort and difficulty in the use of their voice, we must be careful in our advice and prognosis. I have been impressed for years that the method of holding the tongue down in the production of vocal sounds is a wrong one. I made many observations during several years, and became finally convinced that this was the source of all the difficulty in certain cases. I found patients relieved by correcting this method, so that I am satisfied that this was a correct view. Dr. Hinkel referred to the fact that nasal stenosis produces changes in the voice, and Dr. Mackenzie seems to agree with him that such disorders are frequent causes of voice difficulties. I am satisfied that Dr. Hinkel is correct in his observation upon his case, but I am not satisfied that it is by any means a great cause of voice defects. A partial filling up of the nasopharynx is not constant in its effects upon the voice; it may or may not impair it. Of course, if the pharynx were completely filled it would affect the voice, but there is no evidence that a partial filling up would have any such consequences. I entirely indorse the remarks by Dr. Mulhall with regard to the taking of the attention away from the throat; it is very important to a correct vocal method. I also approve his remarks upon the abdominal method. This is very interesting, and I intend to make some observations upon breathing if I live long enough. There is much to be learned with regard to correct methods of breathing. With reference to the case of the clergyman, the observation was a just one. I have elsewhere said that the laryngeal muscles were in position to place the vocal organs in proper place to form a given tone without the wind-blast. The wind-blast does not produce the pitch; the larynx is properly adjusted for the tone before the wind-blast reaches it. If we had to depend upon the delicate adjustment of the wind-blast, how many would be able

to sing in tune? The muscles instinctively put the cords in position to produce the note, which is virtually produced before the wind blast comes, which puts them in vibration and gives out the tone. When the wind-blast is strong it seems as if the cords would not be able to resist it, and yet they do not yield. The station, as I call it, is immovable when the wind-blast comes; the muscle does not give at all: if it did, the tone would change and be either sharp or flat. Therefore the distinction is that the note is not made by the wind-blast, but it is carried on by the wind-blast, and intensified by increase of the wind-blast. Now the question comes up, "What portion of the abdominal muscles should be brought into play to produce the result most effectively?" This I will reserve for future consideration. With regard to the case of Dr. Mulhall, I described one exactly similar to his. I made one attempt to remove the growth and told the patient to come back, but he never did. The growth in this case had already decidedly impaired the mobility of the epiglottis. In reply to Dr. Mulhall, I might state that in a paper by Morell Mackenzie upon the voice he says that some singers protrude the abdomen and some retract it. With regard to the tongue, we must remember that tongues are of different shapes naturally; some are flat and broad, others narrow or wedge-like. Because some singers sing with a flat tongue, it does not follow that others must do it. I am satisfied that the position and shape of the tongue depend upon the motions of the muscles of the larynx. The fact is that some singers sing with the back of the tongue raised, and it is also a fact that others, equally good, sing with the tongue flat.

The PRESIDENT: What do you think of the method in which the tone is thrown to the bridge of the nose?

Dr. LANGMAID: This question might be construed the wrong way. That the resonance is universal and involves the hard parts and also the soft parts is true; that the voice which is not reflected is a dull voice, as the singer says, is true; but that these are the only parts which reflect the voice is certainly not true; ill results to the laryngeal muscles and the voice will come from an attempt to follow this method. I have endeavored to confine my paper to one form of wrong method of voice training, so that I could not be contradicted without having an answer prepared. By keeping on one subject I hoped to avoid vagueness in the discussion which would follow.

The PRESIDENT: Do you not think that the nasal and accessory chambers are too much neglected in the usual teaching of singing?

Dr. LANGMAID: Not by the best teachers. The methods pursued are those intended to develop the best acoustic qualities. For the same reason the Italians have always made use of the resonance of the head. If you choose to call it nasal resonance you may do so.

Paper.

UNILATERAL PARALYSIS OF THE LATERAL CRICO-ARYTÆNOID MUSCLE. (LATERAL ADDUCTOR OF THE VOCAL CORD.) PECULIAR CASES.

By E. FLETCHER INGALS, A. M., M. D.

ALTHOUGH bilateral paralysis of the adductors of the vocal cords is a common affection, unilateral paralysis is not often met with excepting as the result of compression or injury of the recurrent nerve, as, for example, in aneurysms of the aorta or malignant disease of the œsophagus. The affection is, however, met with in rare instances of lead and arsenical poisoning, and it is sometimes observed as the result of exposure to cold. It is sometimes attributed to rheumatism or phthisis, and is occasionally seen as the result of accident or surgical wounds. When accompanied by paralysis of the same side of the tongue or palate it is of centric origin. Two cases which I wish to report, although following shortly after surgical operations in the mouth and naso-pharynx, appear to be of hysterical character, though one would seem to prove that an injury to the terminal extremities of one branch of the eighth pair may, through reflex influences, produce paralysis of distant muscles supplied by an entirely different branch of the same nerve, and the other would appear to indicate that, in the same way, paralysis may be produced in one of the distant muscles supplied by the pneumogastric branch of the eighth pair, while the injury causing it occurred to the terminal loops of one of the branches of the fifth pair.

In these cases the usual dysphonia was present and the sounds produced by coughing or sneezing were more or less altered. In neither were there evidences of hysteria or symptoms indicating constitutional disease. There was neither swelling nor congestion of the larynx in either case, and in neither was there any evidence of injury to the recurrent nerve. The first patient recovered after a few weeks of, mainly, constitutional treatment; the second had been treated by another physician for over two months before coming to me, and has now been under my care for about four weeks without perceptible improvement.

Case I.—Miss M. P., aged twenty-two, school-teacher. This patient told me that two weeks previously she had some teeth extracted, which caused her to faint, and that twenty-four hours later the voice was sud-

denly lost so that she could only speak in a whisper, but her voice had considerably improved. When she consulted me she spoke in a coarse whisper and complained of slight pain at times in the left shoulder and back and of some difficulty in swallowing, which had been present since the voice was first lost. Otherwise she was in perfect health; the appetite was good and digestion normal. I found the voice of about one half its normal intensity. There was no difficulty in respiration and no cough except when attempting to swallow fluids. She was despondent for fear of being unable to return to her work, but there were no evidences of hysteria. There was evident paresis of the depressors of the epiglottis, as indicated by her difficulty in swallowing, though the condition was not discernible upon laryngoscopic examination.

Examination of the vocal cords showed absence of either congestion or swelling. On phonation, the left cord passed about three millimetres beyond the median line, but the right one remained motionless at the side of the larynx. At her first visit I applied a simple stimulating spray to the larynx and ordered pills containing iron and quinine with one twentieth of a grain of strychnine in each. At her second visit the same local application was made and the strychnine continued, though the other remedies were changed. A week later there had been no material improvement. The faradaic current was then applied to the cord itself by means of a double electrode. The internal remedies were continued. A few days later the faradaic current was again employed and the dose of strychnine was increased to one sixteenth of a grain. Four days later the same treatment was repeated. At her next visit (twenty days after she had first consulted me) it was noted that, although the right cord itself was motionless, the tissues covering the right arytænoid cartilage moved considerably on phonation. Three days later there had been slight, if any, improvement. The faradaic current was then discontinued, but the strychnine was increased to one twelfth of a grain three times daily. From this time on I made no local applications. About a week later, as the patient wished to return to her home in the country, I increased the dose of strychnine to one tenth of a grain and gave her in addition a grain and a half of quinine, a grain of the valerianate of zinc, and one fortieth of a grain of nitrate of sanguinarine three times a day. She was allowed also to apply the faradaic current over the larynx as suited her inclination. I heard nothing more from the patient for five weeks. During that time she had continued the treatment, and she then reported herself completely cured. There was no subsequent return of the dysphonia. Some months later I saw the patient and found that the paralysis had entirely disappeared.

Case II.—Miss L. B., aged nineteen. This patient came to me in the latter part of March on account of difficulty in speaking, which not only interfered with her ordinary voice but prevented singing. She stated that for a year and a half she had been troubled with catarrh, and that recently she had been under the treatment of another physician for this

affection. He had found enlargement of Luschka's tonsil, which he had removed at two different operations. The first operation gave her much pain, but at the second operation cocaine was used more freely and there had been little or no suffering. Upon the day following the second operation she had been comfortable and had used her voice more than usual, but on arising the next morning—that is, two days after the operation—she found herself unable to speak louder than a whisper. This occurred eight weeks before the time she first consulted me. In the mean time her voice had gradually improved until at the time I saw her she could speak aloud in a husky tone, but she was unable to sing. During these two months she had been under the treatment of her physician, and had received several applications of the faradaic current. Her general health was excellent and she had no cough or dyspnœa.

I found the nares and naso-pharynx essentially normal, but there was some inflammation of the Eustachian tubes. Upon examination of the larynx, I found the right vocal cord completely abducted and immovable upon attempted phonation. There was no congestion or swelling of the parts. I applied the static current and recommended the internal use of strychnine, but she did not place herself under my care until nearly two weeks later. Upon her return, I applied to the Eustachian tubes and middle ear an oily solution of carbolic acid, gr. ij, and menthol, gr. v, in liquid alboline, ℥ j. This was introduced through the naso-pharynx by means of my ordinary atomizer, with a long bent tip, the nostril being held while the spray was being thrown in. I applied to the larynx a slightly stimulating spray, mainly for its psychical effects, and used the static current externally over the larynx. Thereafter she took sulphate of strychnine in gradually increasing doses until she experienced a peculiar nervousness about twenty minutes after taking the medicine. This did not occur until the dose had reached one tenth of a grain three times daily. It was found that half this dose could be taken six times daily without inconvenience, therefore this method was adopted. The case is still under treatment. On phonation, the supra-arytænoid cartilages of the right side move a little, but the vocal cord remains motionless and the left cord nearly meets its fellow far to the right of the median line. The question has arisen in my mind whether this paralysis could have preceded her attack of aphonia, but everything in the history of the case seems to prove that it did not, and the most critical examination fails to detect any other than a hysterical origin, either centric or along the course of the pneumogastric or recurrent laryngeal nerve.

This patient was completely cured in four weeks after the foregoing was written, and there has been no recurrence.

Discussion.

Dr. Bosworth: There is one interesting point which occurs to me. In several cases of paralysis of one side of the larynx, with complete loss

of voice, and in two instances of falsetto voice, the voice afterward became almost absolutely normal; the voice returned, although the paralysis persisted. This was accomplished by the healthy cord swinging over to the paralyzed side so as to make up for the loss of power on that side.

Paper.

A CASE OF UNILATERAL PARALYSIS OF THE ABDUCTORS OF THE LARYNX, THE RESULT OF AN ATTACK OF BULBAR DISEASE WITH UNUSUAL SYMPTOMS, AND WHICH WAS APPARENTLY CAUSED BY SUPPURATIVE DISEASE OF THE ANTRUM.

By F. H. BOSWORTH, M. D.

THE interesting series of experiments on the functions of the larynx made by Hooper (*Trans. of the Amer. Laryng. Assoc.*, 1885, p. 9; 1886, p. 22; 1887, p. 41; 1888, p. 163), F. Donaldson, Jr. (*Trans. of the Amer. Laryng. Assoc.*, 1886, p. 213; 1887, p. 80), Semon and Horsley (*British Med. Jour.*, 1886, August 28th and September 4th, pp. 405 and 445), Krause (*Arch. f. Anat. und Physiol., phys. Abtheil*, 1884), Onodi (*Ctrlbl. für d. med. Wissenschaft.*, 1889, vol. xxvii, pp. 258 and 289), and Simanowski (*Geschen. klin. Gaz.*, No. 26, 1887) have rendered the question of laryngeal paralyses one of no small interest. As contributing somewhat to our knowledge of the subject from a clinical point of view, I bring before you the following case:

J. W. M., a member of the judiciary in one of our Western States, consulted me on March 27, 1890, with the following history:

In August, 1889, he suffered with an ulcerated second molar tooth, which gave rise to an attack of facial neuralgia, involving the whole of the left side of the face. The tooth was extracted, with relief to the pain, but an offensive purulent discharge, which had set in from the left nasal passage, coincident with the attack of toothache, persisted. He felt and thought this was an accumulation in the antrum. This latter system has continued ever since—an ill-smelling, yellowish discharge, which passes into the fauces and is discharged through the nostril. When lying down, the flow of pus into the larynx is a source of especial annoyance. He is a man of large physique, and has always enjoyed perfect health.

On November 20th he retired in his usual health. He was awakened suddenly in the early morning hours by something happening which he could not describe. On attempting to rise in bed, he found that he fell over to the right side. There was considerable nausea, and, to allay this,

he attempted to drink a little water, but this he found to be an absolute impossibility. He got out of bed with considerable difficulty and got down stairs, but he found himself walking with very great effort and unconsciously turning to the right. He was also very dizzy, and the nausea continued. On further questioning himself as to his symptoms, he found that he was partially paralyzed as to motion over the whole of the right side from the crown of the head to the soles of the feet. On the left side there was paralysis of sensation to this extent: that while the tactile sense was not destroyed, his appreciation of heat and cold was absolutely gone. There was also some slight dyspnœa, although his voice was unimpaired as far as he knew, except that the vocal tones were somewhat peculiar. This latter symptom, of course, was due to paralysis of the palate.

There was no facial paralysis as far as he knew—that is, the face was not drawn, yet it felt heavy and stiff over the right side. There was also some impairment of sight, in that, as he expressed it, the eyes did not focus well. He could neither sneeze nor cough, although he could clear his throat with some little difficulty. The tongue was protruded slightly to the right side. Articulation was not impaired. The sense of taste was notably impaired on the left side of the tongue and the whole of the fauces. As he expressed it, the loss of sensation of taste on the left side extended down to his stomach. He declined to consider himself a sick man and kept about the house, although it was no small effort to move. The power of deglutition was lost for two days, but he commenced to swallow on the third day. This, however, was accomplished but slowly for some weeks. The motor impairment gradually disappeared, and on the twelfth day he walked down the street, though still with some effort. According to his own story, the impairment of motion lasted only two months, although at the time of his visit to my office, four months after, I could detect still some evidence of motor weakness. While this feature of his paresis improved rapidly, the sensory paresis of the left side seemed to improve quite slowly, and at the end of four months there was still a notable failure to appreciate the sensations of heat and cold.

When I first saw this patient he consulted me on account of his antrum disease, and he seemed to think that all his other symptoms had completely disappeared, and really described them to me as a curious experience which had happened to him some months before. I found him to be a man in almost perfect health, in whom a close examination failed to reveal any departure from the normal condition, with the exception of the symptoms above noted of slight sensory paresis of the left side. He went through the ordinary muscular tests of spinal and bulbar disease without revealing any impairment of power. There were the characteristic symptoms of disease of the left antrum, and this was successfully operated upon by opening the antrum through the alveolus. A large amount of pus was discharged and a Bordenave tube inserted.

An examination of the larynx showed the right cord lying motionless

in the median line—in other words, there was complete paralysis of abduction of the right vocal cord.

It would have been interesting to have noted in this case whether there was an anæsthetic condition of the mucous membrane of the larynx. This, however, was not elicited, owing to a somewhat irritable condition of the fauces.

The first question that arises here is as to the cause of the bulbar disease and its possible connection with the suppurative disease of the antrum. This man, as I have said, was in the enjoyment of perfect health, and there was no obvious physical trouble which should have led to the development of bulbar disease other than the suppurating process in the antrum.

Dr. M. A. Starr, who saw this case with me, was disposed to agree with me in the idea that there was a thrombosis of one of the small arteries of the medulla, and that this thrombosis led to some meningeal disturbance extending to the cerebellum, which would account for the loss of co-ordination, with the motor and sensory impairment which characterized the early days of his attack.

The rapid disappearance of symptoms can be accounted for by the early re-establishment of the circulation. I think, without question, this patient had an attack of bulbar disease, in which the symptoms disappeared with unusual rapidity, and at the end of four months the only condition which remained was right abductor paralysis. This seems to have become permanent. The case, therefore, is interesting as one of bulbar disease, due probably to a suppurating process in the antrum of Highmore. It is further interesting as lending weight to the proclivity theory of Semon (*Arch. of Laryngology*, vol. ii, p. 197), and yet it seems to me quite clear that in this case the laryngeal paralysis was the result of a disease of the nerve centers alone. The ganglionic center which presides over the respiratory movements of one side of the larynx lay in the area of distribution of the artery which was occluded. The motor center of the larynx in the medulla has not as yet been practically isolated. The diseased process in my patient, however, seems to have isolated the ganglion which presides over the respiratory function of one side of the larynx whose fibers pass through the recurrent laryngeal nerve; and yet it seems to me there is no evidence whatever that any other fibers of the recurrent laryngeal nerve were in any way disturbed.

Why, therefore, does the paralysis of abduction become permanent, while this patient recovers both motion and sensation of the

other parts involved? There are but two answers to this: either the ganglion presiding over the respiratory function of one side of the larynx is permanently destroyed, or there is an essential proclivity on the part of the abductor muscles to become the seat of paralysis. This undoubtedly exists, and is shown clinically by the fact that when their function is abolished they become the seat of a rapid degenerative process, under which they lose their power of responding to the stimulus of motor innervation.

This latter view, as before stated, seems to be largely established, not only by clinical observation, but is prominently the teaching of the very elaborate series of physiological experiments alluded to at the commencement of this paper.

As I understand Semon's article on the proclivity theory, this condition lies in the fibers of the recurrent laryngeal nerves rather than in the muscles. It certainly seems to me that the weight of evidence is in favor of the view that this proclivity manifests itself in the muscular fibers of the posticus muscle rather than in the nerve. The point is certainly an interesting one, but is scarcely to be entered upon at length here. Another interesting point in this connection is as regarding the question of intrinsic and extrinsic paralysis. I have reported here a case of paralysis of undoubted central origin.

About the time that this patient came under observation another gentleman called on me with the following history:

J. W. C., aged fifty-six, broker. He was of fine physique and apparently in the enjoyment of perfect health, and yet was one who was always exceedingly nervous and sensitive about his own physical health. About six weeks before he had consulted a physician, who, as I understood, made a diagnosis of recurrent laryngeal paralysis due to aneurysm. This diagnosis so completely unnerved him that he was practically confined to his house in a state of nervous prostration for from four to five weeks. As soon as he was able he came to New York. On examination, I found his left vocal cord moving in about one half its normal excursion; in phonation it was approximated nearly to the median line, while in inspiration it was abducted to perhaps a little more than one half the normal extent. Its movement was somewhat sluggish, but there was unquestionable movement both in the cord and in the arytenoid cartilage.

I made an examination and found nothing abnormal in the thorax. This patient, at my suggestion, consulted Dr. Loomis, who pronounced him absolutely sound, as to both heart and lungs. My own diagnosis already made was that of partial ankylosis of the crico-arytænoid joint, due probably to the rheumatic habit. The diagnosis was given with ab-

solute positiveness and the patient returned to his home reassured, and, as far as I know, has had no return of his neurasthenic symptoms. The local symptoms in the fauces had never been other than of a mild form of naso-pharyngeal catarrh.

Here was a case pronounced one of paralysis by a very competent observer, and yet, in my opinion, it was one which should not be regarded as either intrinsic, myopathic, or any other form of paralysis.

I make this assertion deferentially and not polemically, but mainly on the ground that it seems to me our nomenclature will be very greatly cleared up by relegating a very large proportion of our cases of so-called intrinsic paralysis to a totally different classification, and confining the word "paralysis" to those cases which are due to a diseased condition either of the nerve trunk or of the ganglionic centers.

Coming back now to the question of central paralyses, I find a number of cases of recurrent laryngeal paralysis, involving one or both sides, reported by the following observers as due to bulbar disease: In a case reported by Hughlings Jackson (*Lond. Hosp. Reports*, 1864, vol. i, p. 361) there was paralysis of the right recurrent laryngeal. In a second case by the same author (*loc. cit.*, p. 368) there was paralysis of both cords. In a third case by the same observer (*Lond. Hosp. Reports*, 1867, vol. iv, p. 314) there was paralysis of the left cord. In a fourth case by this writer (*op. cit.*, p. 318) there was paralysis of the right recurrent laryngeal. In a case reported by Proust, cited by Hallopeau (*Des paralyses bulbaires*, Paris, 1875, history 23), there was paralysis of both cords. In a case reported by Senator (*Arch. f. Psychiatrie*, vol. xi) there was paralysis of both cords. Eisenlohr (*Deut. med. Woch.*, 1886, p. 363, also *Arch. f. Psych.*, 1887 and 1888, vol. xix, p. 314) reports three cases, in two of which there was recurrent paralysis on both sides, while in the third there was recurrent paralysis of the left side. Sokaloff also (*Deut. Arch. für klin. Med.*, vol. xli, p. 458) reports a case of left recurrent paralysis.

All these cases resulted in a fatal termination, and post-mortem examinations were made in all, with the exception of Hughlings Jackson's first two cases. The lesion in every case was found to be extensive destruction of the medulla, involving the pyramids, olivary bodies, restiform bodies, floor of the fourth ventricle, etc. In other words, we find here a series of cases in which the bulbar disease was of such an extensive character as to produce a fatal termination; and, furthermore, that where the local disease was so extensive it resulted

in the completest possible paralysis of the muscles of the larynx—viz., recurrent laryngeal paralysis of one or both sides. In the third of Eisenlohr's cases, above alluded to, the post-mortem examination showed the left recurrent nerve involved in a thickened pleura, which might possibly have been considered as causing the laryngeal paralysis; yet there was also an extensive degeneration of the medulla, and, furthermore, the laryngeal symptoms antedated the pulmonary disease by about two years.

In addition to the foregoing, Oppenheim (*Berl. klin. Woch.*, 1886, No. 40, p. 675) and Kehler (*Zeit. f. Heilk.*, 1881, p. 440) report cases of recurrent laryngeal paralysis, the former involving the right cord and the latter the left, as occurring in connection with locomotor ataxia. Wegner (*Annual of the Universal Med. Sciences*, vol. i, p. 89) takes the ground that the laryngeal paralysis in cases of tabes usually takes the form of paralysis of the abductor muscles, citing two of his own, and making a compilation of a number of other instances. This certainly is not the rule, in view of the cases just instanced, although, in addition to Wegner's, we find Krause (*Berl. klin. Woch.*, 1886, No. 20, p. 651), Ross (*Brain*, London, 1888), and Saundby (*Birming. Med. Review*, December, 1886) reporting cases of tabes in which there was bilateral abductor paralysis; while, in a case reported by Semon (*loc. cit.*) of double abductor paralysis, the patient subsequently developed tabes. In a case of tabes reported by myself (Laryngeal and Pharyngeal Paralyses, *Journal of Nervous and Mental Diseases*, 1889, Case I) there was bilateral paralysis of the laryngeal abductors. Hubbard (*Toledo Med. and Surg. Reporter*, 1889, vol. ii, p. 576) reports a case of tabes in which there was recurrent laryngeal paralysis of the left side.

Of course there is no special clinical deduction from the laryngeal paralysis in locomotor ataxia other than that the extent and direction which the sclerosis takes dominate the form and extent of laryngeal paralysis.

In addition to the foregoing, I find cases of double abductor paralysis reported by Ollivier d'Angers, cited by Gottstein (*Die Krank. des Kehlkopfes*, 1888, p. 309), Krause (*Neurol. Centralblatt*, 1885, p. 543), and Penzoldt (von Ziemssen's *Cyclop.*, vol. vii, p. 962), in all of which the autopsy showed extensive lesion of the medulla, while in a case reported by Smith (*Brit. Med. Jour.*, July 13, 1878) there was evident central lesion, although no autopsy was made.

This would seem rather a small proportion of cases of bilateral abductor paralysis in which the central lesion was established, and

yet it must be borne in mind that a very large proportion of cases of this disease have clearly been traced to local morbid processes, while in others the mere insertion of a tube has so far prolonged life that the origin of the disease has remained obscure.

As regards unilateral paralysis of the abductor muscle, the number of cases reported in literature is not large: moreover, this affection gives rise to comparatively trivial symptoms, and undoubtedly in many cases escapes observation. Of this form of unilateral paralysis of abduction in the larynx cases have been reported by Gerhardt, cited by Gottstein (*op. cit.*, p. 310), McBride, cited by Gottstein (p. 311), Nothnagel (*Wien. med. Blätter*, 1884, No. 9), Martius (*Charité Annalen*, 1889, vol. xiv, p. 315), and Delavan (*Med. Record*, Feb. 14, 1885, p. 178). In all of these cases an autopsy revealed lesion of the medulla or base of the brain. In Delavan's case it should be stated that the form of paralysis is reported as complete paralysis, the cord lying in the median line, which seems to leave it somewhat uncertain whether this is abductor or recurrent laryngeal paralysis. In a case reported by Wright (*N. Y. Med. Jour.*, 1889, vol. l, p. 345) the observer considered the disease of central origin, although no autopsy was made.

From this category there is omitted quite a number of cases in which the disease is attributed to local causes.

The object of my paper is fulfilled, therefore, in the report of the case which is the text of my remarks, and the further suggestion that we have completed our duty in no case of laryngeal paralysis unless we have either thoroughly eliminated or established the question of a central lesion as the source of the morbid condition. In other words, I am disposed to think that a central lesion is responsible for a genuine paralysis of the vocal cords in a somewhat larger proportion of cases than is usually believed.

Discussion.

Dr. Westbrook: I should like to ask the author of the paper if he would not consider it possible that the short duration of the motor paralysis, the suddenness of onset, and subsequent history of the case, might rather tend to exclude the idea of lesion of the medulla. A lesion of the medulla sufficient to cause so extensive a paralysis, to give complete hemiplegia, I should not think could be recovered from so readily. I should think that a case like this might be accounted for on the supposition of an embolus passing into the middle cerebral artery, or a thrombus in the sinus or in one of the other vessels at the base. An embolus or thrombus affecting the internal capsule might account for the paralysis. But

the whole thing might be due to a tumor or clot in one of the venous sinuses at the base of the brain. It seems more probable that it was of this character than that it was a lesion of the medulla itself; a lesion of such extensive nature as this must have been, occurring near the medullary center for respiration and the vaso-motor center, would have been likely to be quickly fatal. At all events, the patient would not be likely to recover so completely or quickly.

Dr. Bosworth: In reply to the question, I would say that there is no doubt about the bulbar nature of the lesion in view of the extent of the paralysis. There was loss of deglutition and of power in other muscles supplied by the eighth pair of nerves; the laryngeal paralysis with hemiplegia all point to the bulb or the origin of the eighth pair of nerves in the floor of the ventricle. The extent of the case, the history of a chronic suppurative process in a closed cavity, suggest thrombosis of one of the small arteries, from the basilar supplying the medulla. The absorption of the embolus would account for the rapid recovery, for the occurrence of softening would naturally take some time. An interesting point is the occurrence of hemiplegia. I recall no case on record in which thrombosis in the medulla caused hemiplegia, which makes this case especially interesting. There was also some cervical adenitis, which still further supported the view of lesion at the base and in the cerebellum.

Paper.

A NEW OPERATION FOR DEVIATION OF THE NASAL SEPTUM, WITH A REPORT OF CASES.

By MORRIS J. ASCH, M. D.

THE distress occasioned by a permanently occluded nostril in the shape of mouth-breathing and the various complications that accompany this condition is brought so often to the notice of the nasal surgeon that any operation that will easily remedy the difficulty is worthy of notice. The pathology and symptoms of a deviated septum have been so often described that I will not occupy your time with them, but content myself with calling attention to the operative procedure by which I remedy the defect. It is particularly adapted to those cases in which there is a deflection with increased length of the septum, and where there is adhesion to the inferior turbinated body; its great advantage being in its simplicity and in its easy and rapid performance—that it involves no loss of substance and entails but little annoyance to the patient after the operation. I have found the operation to be perfectly satisfactory, permanently relieving the obstruction in all cases; only those in

which there existed deflection of the bony septum discovered after the correction of the cartilaginous deformity required any further treatment. In one case only was there any hæmorrhage of a severe character, which was easily checked; and in one case—not among those here reported—there remained for two or three years a small perforation which has since healed.

In all of these cases the deviation of the septum was toward the left, a fact in accord with the observation of most writers.

The instruments I employ in this operation are—

1. A pair of strong cartilage scissors, one blade thick and blunt for introduction into the obstructed nostril; the other, the cutting blade, of a curved wedge-shape, the shanks curved outward so as to admit of closing without interfering with the columna. The handles are of steel and curved, like those of a dental forceps (Fig. 1).

Fig. 1.

Fig. 2.

2. A curved gouge for breaking up any adhesions that may exist between the septum and turbinated body (Fig. 2).

3. An Adams forceps, or one with stout parallel blades.

4. A triangular splint of tin, cut to adapt itself to the cartilage of the section. Formerly I used a splint of a more elaborate character, such as I show you here (Fig. 3); but it had the objection of being always in sight and I gave up its use, although in other respects it proved perfectly satisfactory. If the patient has a good deal of nerve, the operation may be performed with the aid of cocaine; but, as a rule, it is best to use ether. Before the operation the nostrils are to be well washed out with a disinfecting solution, such as listerine or, what I have been accustomed to use, Dobell's solution with the addition of thymol and eucalyptol. The patient then having been etherized, the adhesions between the septum and turbinated body, when such exist, are broken up by the use of the curved gouge. The blunt blade of the scissors is inserted into the obstructed nostril, and the cutting blade into the other; a crucial incision is then made as near as possible at right angles at the point of greatest convexity. The forefinger is then inserted into the obstructed nostril; the segments made by the incision are pushed into the opposite one, and the pressure continued until they are broken at their base and the resiliency of the septum destroyed. On this point depends the success of the operation, for, unless the fracture of these segments is assured, the resiliency of the cartilage will not be overcome and the operation will fail. The septum is then to be straightened with the Adams or other strong forceps, and the hæmorrhage checked before proceeding further, which is usually accomplished by a spray of ice-water, though sometimes tamponing may be required. The nostril having been cleaned, the straightened septum is then held in position by the tin splint previously wrapped with absorbent cotton moistened in a solution of bichloride of mercury of 1 to 5,000, and the nostril packed with gauze or absorbent cotton moistened with the same. The tamponing must be thoroughly done or hæmorrhage will certainly recur. I usually introduce a pledget of gauze or cotton, to which a ligature is attached, as far into the nostril as is possible, leaving the string hanging out, and pack the moistened pledgets firmly upon this. The splint and tampon are allowed to remain undisturbed for four days, when they are removed and the parts cleansed with a disinfecting solution; the

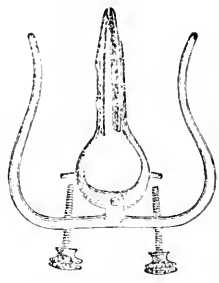


Fig. 3.

splint and tampon are then reapplied, the parts being straightened, if necessary, with the forceps. This is repeated two or three times a week for three weeks, by which time the parts have become permanently fixed in their improved position; but it may require at least two weeks more before the parts are healed and the patient breathes through an unobstructed nostril. It sometimes happens that posteriorly to the cartilaginous deviation a bony one exists. This can then be easily remedied by the electro-trephine or saw. The cases which I report here were all, with one exception, operated on at the New York Eye and Ear Infirmary, and the after-treatment was carried out by Assistant Surgeon Dr. Emil Mayer, to whom I am indebted for their report. I have delayed presenting the report of this operation to you until I had assured myself that its results would prove satisfactory and permanent; but now that the operation has stood the test of time, I feel that I am justified in doing so. The operation is simple and easy, requires but a few minutes for its performance, involves no loss of substance, and the operator is not embarrassed in his work by the bleeding—a practical point which I am sure all who are familiar with nasal surgery will appreciate. Of the cases reported, the incisions in the first two were made by the bistoury instead of the cartilage scissors, but the principle of the crucial incisions with fracture and tampon was the same.

Case I.—A. W., female, aged eleven, patient of Dr. Mayer's, was brought to New York for treatment for nasal stenosis, said to be due to a fall in infancy. The cartilaginous septum is deviated to the left near the orifice of the nostril, which is completely obstructed, no air passing. She is a mouth-breather, and the voice has a nasal twang. Operation performed under ether on September 19, 1883. The crucial incisions were made with a knife through the cartilage, the fragments fractured, and the nostrils plugged with antiseptic cotton, which was removed on the third day. There had been no bleeding and no rise of temperature. After washing out the nostril, the left side was repacked, the parts being kept straight with the Adams forceps. On September 30th plugs removed; patient breathes freely through both nostrils. The straightening forceps are introduced tri-weekly, and on October 24th patient is discharged cured.

Case II.—Louise H., aged seventeen. Patient of Throat Clinic, New York Eye and Ear Infirmary. The left nostril is completely obstructed by a deviated cartilaginous septum, which is firmly adherent to the inferior turbinated body of the same side. Operation performed at infirmary, September 28, 1884, under ether. The adhesions were broken up, and the crucial incisions and fracture accomplished. The septum straightened, and held in position by a specially devised splint (Fig. 3).

This consisted of an external, lyre-shaped frame, to the center of which, on a hinged joint, two plaques of hard rubber, of a shape similar to the triangular cartilage, were attached. The plaques, being adjusted to their place in either nostril, were fastened in their position by the screw passing through the outer frame, and the nostrils afterward tamponed. There was no constitutional disturbance. In three weeks after tri-weekly applications of the straightening forceps the patient was discharged cured.

Case III.—Philip L., aged thirteen, came to the clinic of the New York Eye and Ear Infirmary with nasal obstruction; is a mouth-breather. Hearing defective in left ear; is dull and apathetic; the cartilaginous septum is deviated to the left and is firmly adherent to the inferior turbinated body, the greatest convexity being an inch and a quarter from the nasal orifice.

The operation was performed under ether at the infirmary, December 1, 1888. The adhesions having been broken up by the gouge, the cartilage was incised with the cartilage scissors, the segments fractured, and splint and tampon applied. After the cartilage was straightened, a long, bony obstruction was found to exist behind it, which was afterward removed by means of the electro-trephine. This was finally accomplished in six weeks, and on February 15th the patient was discharged cured, breathing freely with closed mouth, and hearing greatly improved. A recent report from this case shows the improvement to be permanent.

Case IV.—Fannie M., aged sixteen, came to the clinic of the New York Eye and Ear Infirmary complaining of nasal obstruction and deformity, the result of violence when three years old. Examination shows the left nostril to be entirely occluded by a deviated septum, the tip of the nose being bent to the right. She is more anxious to be relieved of the deformity than of the obstruction. The operation was undertaken with the view of curing both. Operation at infirmary, December 22, 1888, under ether. Crucial incisions, fracture, splint, and tampons. After straightening the septum, a strip of rubber plaster was applied to the tip of the nose, and traction made by fastening the end to the left cheek. The traction was faithfully kept up for some weeks after the patency of the nostril was re-established, and when seen on May 4, 1890, by Dr. Mayer, the deformity had entirely disappeared.

Case V.—Julius R., aged sixteen; clinic of the Manhattan Eye and Ear Infirmary. Operation, under ether, May 22, 1889. Operation and after-treatment as in the other cases. Discharged cured on June 15, 1889.

Case VI.—B. R., male, aged seventeen, referred to Throat Clinic of New York Eye and Ear Infirmary by Dr. Rupp, surgeon in the Ear Department. The patient is entirely deaf in left ear. Left nostril completely occluded. Operation, under ether, February 8, 1890. Same procedure as in previous cases, the resulting hæmorrhage, however, being

more than ordinary. During the night succeeding the operation his breathing was alarmingly interfered with during sleep. On being awakened by the nurse, he was found to be bleeding from the mouth, and large coagula were expelled from the pharynx. The tampons were removed, the nose cleansed, and the bleeding checked by ice, after which the splint and tampon were replaced. On the 7th hæmorrhage recurred during the night, but was checked by ice. On the 15th he went to his home, when bleeding again occurred, which was controlled by my assistant, who was sent for. After this there was no further trouble, and the regular after-treatment was carried out. On March 20, 1890, Dr. Rupp reports marked improvement in the hearing, and on April 30th the patient reports that he breathes freely through the formerly obstructed nostril.

Discussion.

Dr. J. C. Mulhall said: I am very much interested in this subject, for one reason at least, because we have in our city (St. Louis) the gentleman who first introduced the instrument which is generally used for overcoming the resiliency of a deviated septum. I refer to Dr. Steele, the inventor of Steele's forceps. I have performed a number of operations, some fifteen or twenty, with this instrument, and I may say that I have not been entirely pleased with it. I am therefore much interested in Dr. Asch's operation, which promises so much from a single incision of the septum, while Dr. Steele's forceps makes six incisions. One objection to the latter is that at the center of the crucial incisions a perforation not infrequently results, upon which crusts form, to the great annoyance of the patient. In maintaining the septum in position after operation, I have found nothing answer the purpose so well as a small rubber nipple, adapted to the size of the nostril and stuffed with cotton, so as to accommodate it to the cavity. This is the best plug to retain the septum in proper place. With regard to the recurrence of the stenosis, I may say that I have been uniformly successful in establishing breathing through the stenosed side by this method.

Dr. Jarvis: The remark with regard to the occurrence of perforation leads me to say that, some time since, I constructed a modification of Steele's forceps which makes six radiating incisions, but leaves an uncut island in the center, thus avoiding the accident just referred to. I have not published a description of the instrument, but it is figured in Reynders's catalogue. In this connection I might call attention to a suggestion concerning the after-treatment. Finding that plugs of hard rubber, glass, ivory, or gauze give rise to pain and irritation, I have abandoned all internal splints and devised an external nasal splint, coated with very soft leather, or a soft kid pad containing metallic mercury, which has given just as good results without intranasal irritation.

Dr. Ingals: The operation proposed by Dr. Asch is not new, but is a modification of the usual plan of treatment. The late Professor Moses

Gunn, of Chicago, was accustomed to make a crucial incision through the greatest convexity of the cartilaginous septum, making the incisions obliquely, and then forcing over the segments and retaining them by means of a rubber tube passed through the obstructed side. When the septum is bent nearly horizontally across the naris, I still prefer the removal of a triangular piece, so as to allow it to fall into proper position, as recommended in my paper read at the Boston meeting of this association. When there is simple bending, with little or no hypertrophy, I use a small trephine, 3 mm. in diameter, with which I remove beneath the mucous membrane three or four cylindrical pieces from the convex portion of the septum, sufficient to completely destroy its resiliency. It is then comparatively easy to place the septum in its normal position and keep it there with some kind of splint. My own custom is to introduce into the nasal chamber of the affected side a pledget made with a long strip of antiseptic gauze saturated with a thick mixture of tannin and water. The other nostril is left open. Twenty-four hours afterward I have the pledget removed, and then cleanse the nose and insert a tube made of gutta percha, molded to fit the cavity. This should not be large enough to cause the patient discomfort. I use the ordinary sheet gutta percha employed by dentists, which may be easily molded when warm to suit the requirements of each case. It has proved to me more satisfactory than either ivory, soft rubber, or any of the rigid clamps, and it is infinitely superior to cotton, which not only fails to keep the septum in proper position, but speedily becomes offensive.

Dr. Roe: This method seems more particularly directed to the cartilaginous septum. A somewhat similar plan which I have followed is to make an incision on the convex side in the direction of the greatest convexity, either vertical or diagonal. Then, taking an Adams's forceps, I bend the septum forcibly over to the opposite side until, when left to itself, it keeps a perfectly straight position. Upon the side of the convexity is placed a plug, consisting of metal covered with absorbent cotton. After all hæmorrhage has been checked, I thoroughly disinfect with iodoform, and then introduce a plug as large as can possibly be put into the nostril, adding sufficient absorbent cotton to keep it in place. No plug is placed on the opposite side. The plug should be as wide as the nostril will permit, and, by dipping it in a 1-to-2,000 solution of bichloride of mercury, it is kept thoroughly aseptic. It may be left in position for from four to six days; if necessary to renew it, the same method is followed. When there is deviation also in the bony septum, I break that up with a forceps, and afterward keep the septum in place in the manner described. I have found that these soft plugs are far better than the hard ones, either of rubber or of metal, which are very apt to cause destruction of the mucous membrane by pressure. In the cases of deviation of the bony septum there is almost always an ecchondrosis or an exostosis on the convex side, which must be removed. For this I generally use the nasal saw, so

that the septum is of the normal thickness before attempting to restore it to its normal position.

The PRESIDENT: With reference to the principle of this operation, it s of course old. As I showed in a communication presented some years ago, it was first suggested by Bolton, of Richmond. Dr. Bosworth gives Chassaignac the honor, although I can not see why he should. With regard to Steele's forceps, I have used it a good many times and have not been satisfied with it. I find that it does not cut through the septum. The only forceps made on that plan that I use is that made by Gemrig, of Philadelphia, which is called Steele's forceps, but is really a modification of the original. This is the only really practical instrument I have ever used. I invented an instrument myself which cut through the septum, but it was very difficult to get out of the nose, especially where the patient was a little unruly; I afterward discarded it for the instrument made by Gemrig.

This class of cases is one of much interest. In some you will operate, and in the course of a few months the patients return in just as bad condition as before. Therefore any operation which promises the restoration of the septum to the median line should be well received and carefully tried. Dr. Asch's paper is very well timed and his method is worthy of trial.

With regard to Dr. Jarvis's external nasal splint, I am sorry to make an unfavorable report. It has not proved satisfactory in my experience. The plug seems necessary, and yet I have comparatively rarely seen a patient who could endure it for six days or more, as some advise. So early as the second day there is profuse secretion, more or less purulent, and the patient begs to have it out. There is no need of plugging both nostrils. I have tried all kinds of plugs, and generally remove them the day after they are introduced. I think that absorbent cotton with glycerin or vaseline is about as good as any you can get for this purpose. In children it is infinitely superior to the ivory plug. I have had one case in which the introduction of an ivory plug caused convulsions of the corresponding side of the body. This phenomenon was repeated several times. On this account I was obliged to abandon the use of the plug, and I recommended in place of it pressure by the little finger inserted into the nostril to push the cartilage over and keep it in the median line. By doing this frequently, the patient obviated the necessity of using the plug. The cutting of the septum is really the smallest part of the treatment; it is necessary to retain the septum in place, and the after-treatment presents the real difficulty, and is often the cause of failure. Orthopædic appliances are of but little value here.

Dr. LANGMAID: It does not matter so much how you break down the septum. The problem is analogous to that presented by a case of hare lip, to prevent the recurrence of the deformity. You may adopt any operation, but the septum must remain in the new position or the operation will be a failure. In order to prevent recurrence, I insist that the opera-

tion must have the result of destroying the resiliency of the deviated septum, so that it will, of itself, remain in proper position without being held there by a plug or splint. I must bear testimony to the value of the black rubber-nipple plug stuffed with cotton. In small children a very small plug may be used, and it need not be soft; but in older children it may be filled with cotton and iodoform and answers the purpose very well. In addition, the expedient mentioned by the president—of making pressure with the finger—is useful, the patient being instructed how he may aid the treatment by inserting his little finger several times a day. In many cases a purulent discharge is set up, and there may be neuralgia and other nervous symptoms. The size of the nostril should be borne in mind in making the plug so that it will go in easily; as the septum will remain in place, there should be no pressure and no pain or inconvenience.

Dr. Jarvis: With regard to the external nasal splint, I would only add that, although I have used it in a number of cases, I have lately discarded it in favor of a new crown drill, which quickly cuts away the septal distortion. I agree with the president that orthopædic appliances are out of place in intranasal surgery. The rule is always to remove sufficient

tissue to give plenty of room. By using transfixion needles to guide the drill, I avoid perforating the septum. If there is an exostosis, I riddle and remove it; if I can not get sufficient room by this procedure, I take away part of the turbinated tissues or bone.

Dr. Bosworth: I must compliment Dr. Asch for presenting a most ingenious intranasal splint. It corrects not only vertical displacement, but horizontal displacement as well.

In reply to the last remark of Dr. Jarvis in regard to removing the turbinated bodies, I wish to ask if it is not unjustifiable to remove an important organ of the body simply for the purpose of admitting air through the nose? The object of the treatment is to restore normal function, not to straighten a deviated septum. I deny that it is primarily for the purpose of giving more breathing space. It is not justifiable to remove this organ, the functions of which are for the time not hampered, any more than it would be justifiable to remove a kidney for functional disorder. I do not admit that the primary object is to admit more air; that idea is based upon an entirely erroneous conception of the purpose of the operation.

Dr. Jarvis: The primary object is not cosmetic; in my mind it is to remove an obstruction and afford more breathing space.

Dr. Mulhall: I wish to say a word in defense of Steele's forceps. The objection has been raised that it does not cut through the septum. It is evident from the discussion that the gentlemen have been talking

about two entirely different things, a deviated septum and a thickened septum. Steele's forceps will not pass through a thickened septum, it is true. When I get such a case, I first treat the hypertrophy and reduce the thickened septum to its normal size, and then apply the forceps, and find no difficulty in making the blades meet. Then, again, the Chair has stated that there was a great tendency to recurrence of the deformity after operation. This is true, but I have never seen the recurrence complete. After the cutting I push the septum over and make it project upon the opposite side, using the handle of a tooth-brush to force it over. I then plug the affected side with a rubber nipple stuffed with cotton. There may be some return, but never to the original extent.

Dr. INGALS: As intimated by the author, the secret of successful treatment is, destruction of the resiliency of the septum during the operation, which renders the after-treatment simple, but if this is neglected the patient can not tolerate suitable plugs or splints, and imperfect results must follow. I have had patients wear tubes of gutta-percha from four to six weeks without discomfort, and I have found the results of the operation very satisfactory. Where there is great thickening of the septum with deflection the excess of tissue must be removed.

The PRESIDENT: I did not mean a thickened septum, but in ordinary cases of deformed septum I have used Steele's forceps and could not get it to close. I could not cut through thick paper with Steele's forceps, but with other forceps I cut through six thicknesses of chamois skin.

Dr. DALY: The object being to get rid of the resiliency of the septum, it can be accomplished with Steele's forceps. I have never experienced any difficulty, but I do not satisfy myself with a single cut; I make two or three incisions irregularly in the septum to break up the cartilage. The fact that the cutting blades of the forceps do not perforate the septum is an advantage. The operation should not be done too early in life. If we wait until the patient is old enough to appreciate the importance of the operation and co-operate with us in our after-management, we shall usually be successful.

Our success in operating depends sometimes upon very simple things. I wish to show my plan of plugging the nostril. Take some absorbent cotton and make a little roll about as large as my middle finger; around this wrap some ordinary grocer's white cotton cord from one end to the other in a long spiral. Now, if we fold this in the middle, and, after tying the ends, apply vaseline, with a styptic or antiseptic, and carry it deep into the nasal chamber, the ends with the cotton twine are external and may be cut off. When it is desired to remove the plug, it is only necessary to pull both ends of the cotton string and it comes out entire with the cotton plug in its embrace. I have found this expedient a great saver of time and trouble. I have also used it in cases of nasal hæmorrhage. It can be dipped in iodoform or some styptic, if desired. I consider it a very good point in practice.

Dr. HOLDEN: As the discussion is upon deviated septum, it may be of

interest to present a case illustrative of the difficulties one may encounter from recurrence. It is that of a young lady, an artist, of fine appearance, but who unfortunately had a seriously deviated septum. She was very much annoyed by it and was willing to submit to any operation for its correction provided there should be no perforation. The septum was thin and rather mobile, and crackled like parchment under the finger when it was moved. It was so thin that I feared a cutting operation might produce a perforation. With a periosteal elevator the cartilage was set over and retained with an antiseptic cotton compress. In three months' time the deviation had recurred. I then repeated the operation, forcibly pressing the septum over to the opposite side. The relief was all that could be desired, but in two months there was again deviation. She was resolutely determined to have the deformity corrected, and I now made two semilunar incisions and removed an ovoid piece of the cartilage by careful dissection, and used compresses as before. The deformity returned. The redundant portion of the (fortunately now thickened) septum was sawed off without perforation. The result was good for several months, but she returned just as bad as she was before. I then resorted to Steele's forceps, crushed the septum at two points, set it over in place, and also crushed the osseous septum at its junction with the cartilage, making in all three incisions. An ivory plug was introduced slightly hollowed out on one side for the turbinated bone. This was wrapped with a very thin film of bichloride cotton. She wore this ivory for five days before removal, and continued to wear it altogether for five weeks. The result is satisfactory save that there is some projection at the base of the cartilaginous septum, which may yet require another operation by saw or drill.

Dr. Asch: I feel very much pleased that the paper has provoked so much discussion; it shows that I was not mistaken in my estimate of the importance of the subject. Part of the discussion, however, seems based upon a misunderstanding of my remarks, or perhaps I may not have expressed myself clearly. I said that the success of the operation depended upon overcoming the resiliency of the septum, and placing it in proper position. The resiliency being overcome, the splint is introduced, which causes no irritation; the nostril is plugged lightly; there is no trouble whatever, and in a very few days the parts are healed. With regard to Steele's forceps, it was owing to my failure to succeed with that instrument that I was led to devise these scissors. I found that it did not completely penetrate the cartilage. In the plan of operating recommended by Dr. Jarvis, the resiliency of the cartilage is not overcome, and the deformity will therefore be reproduced. With reference to his criticism upon the plug, I may say that I never experienced any difficulty arising from it, or observed any signs of septic infection.

Paper.

ON THE EARLY DIAGNOSIS OF MALIGNANT DISEASE OF THE LARYNX.

By D. BRYSON DELAVAN, M.D.

THE early diagnosis of malignant disease, in general by no means easy, is nowhere more difficult than in the mucous membrane and on the glandular structures in the neighborhood of the throat. From a simple inspection of the surface of the suspected region so little may be learned that it has become the accepted custom to withhold judgment in doubtful cases until a diagnosis can be established by the aid of the microscope, or, on the contrary, excluded through the testimony of the lungs, or upon the results of constitutional treatment. Thus it would be supposed that if a thickening or ulceration of the larynx were associated with pulmonary lesions indicative of phthisis, the disease of the larynx would probably be tuberculous; that a localized tumefaction and congestion of the pharynx or larynx which seemed to yield to the internal administration of the iodide of potassium would probably be syphilitic; and, finally, that a similar lesion, associated with well-marked evidences of specific disease, could hardly be other than a manifestation of that dyserasia. Accordingly, we are taught that cancer, syphilis, tuberculosis, and lupus all present characteristics which distinguish them to the eye, and that, besides the visual evidence offered, the diagnosis can be still further sustained by the corroborative evidence mentioned above.

Unfortunately, however, none of these assumptions are able to stand the test of experience. Not only are the objective appearances present in a given case of swelling or ulceration puzzling, or perhaps contradictory, but even the history of the case and the subjective symptoms are sometimes obscure and misleading. As an example of this, a large number of the cases in which the microscope has revealed tubercular disease of the tongue have been operated upon under the supposition that the disease was malignant, and the diagnosis only established upon a microscopical examination of that organ after its removal. On the other hand, obscure cases, in which the characteristic appearances of tubercular ulceration have been present, have been promptly healed by the iodide of potassium. Exceptional cases of the nature alluded to are not rare. For the purpose of ar-

ranging them more accurately and of explaining them more fully, the following classification is offered:

I. Cancer of the larynx may be uncomplicated, but the diagnosis obscured by the absence of the usual signs and symptoms. On the other hand, conditions other than cancer may be mistaken for that disease.

II. Cancer of the larynx may be associated with or mistaken for tubercular disease. Conversely, tubercular disease may closely resemble cancer.

III. Cancer may be associated with or simulate specific disease. On the other hand, syphilis may readily be mistaken for cancer.

Difficulty of diagnosis in laryngeal cancer, therefore, may present itself in two general classes of cases—namely, those in which the disease exists by itself and uncomplicated with other conditions; and, secondly, those in which the recognition of its presence is made difficult by the existence of some complicating factor.

These conditions have all occurred in the writer's experience—some rarely, others with considerable frequency—and it has seemed that no better way of describing them could be chosen than that of presenting a few of the more instructive cases bearing upon the less common varieties.

Of the uncomplicated cases seen by the writer in which the diagnosis was obscure, the following, observed a number of years ago in the dead-house of the New York Hospital, is the most interesting and unusual, and well illustrates the difficulty of diagnosis sometimes met with:

Case I.—Male, aged fifty-four, married, Italian. Denied specific disease. Badly nourished. Principal symptoms, laryngeal cough, aphonia, and occasional dyspnœa. Laryngoscopic examination made by the writer revealed apparent paralysis of the right side of the larynx with moderate thickening of the false vocal cord, the surface of the mucous membrane of which was distinctly smooth. There was slight loss of motion of the left side of the larynx, abduction not being completely accomplished and marked spasmodic action being sometimes observed. Tracheotomy was recommended, but the patient died in an attack of dyspnœa while it was being performed. The autopsy revealed a subglottic enlargement of the right side of the larynx, the surface of which was nodular, which on microscopic examination proved to be epitheliomatous, and which was completely overhung by the right vocal band and concealed by it, so that its demonstration by the laryngoscope was impossible. There was no ankylosis of the arytænoid articulations.

A more striking case than the preceding is—

Case II.—Mrs. G., married, aged thirty-five. The husband of this woman, aged forty, developed an ulcerative condition of the larynx, which presented all of the characteristic appearances of epithelioma, both to the eye and under the microscope, and which followed the usual course of that disease, and finally destroyed the patient's life. During the progress of the disease in the husband the wife also became affected with what appeared to be precisely the same condition. Her symptoms, subjective and objective, were so similar to those present in the case of the husband and so thoroughly characteristic of epithelioma, that it was impossible to offer a prognosis more favorable in the case of the one than in that of the other. With both it became necessary to perform tracheotomy. The effect in each case was, as usual, temporarily to retard the progress of the disease. Subsequently the man died. The woman, in whom the disease was limited to the right side of the larynx, meanwhile fell into the hands of the late Dr. Elsberg, who, operating upon her at repeated sittings through the tracheal opening, finally succeeded in removing the offending tissue. The patient recovered, and up to eight years afterward was often seen by the writer, in excellent general condition and with a larynx in which there existed not a sign of active disease, although the right vocal band was gone, the right side of the larynx immovably fixed, and the rima glottidis so narrow that the use of the tracheal cannula was still required. The question of the precise nature of the above case remains unsettled, as I am unable to learn that any microscopical examination of it was ever made. Examined side by side with the husband during the active stage, it was impossible to believe that the disease in the wife's case was not malignant, while the fact of its non-recurrence is strong proof of the improbability of its having been epithelioma.

The deceptive character of growths of the larynx of the papillomatous class has become almost proverbial. Not only is the eye at fault in judging of many of them, but even the microscope may sometimes lead us into error. This latter accident can hardly be misunderstood by any experienced pathologist, for it is not uncommon, in examining the whole thickness of a tumor, to find that the elements near the surface differ materially from those of the deeper portions of the growth. It would be supposed that the external appearance of an ordinary papilloma would be sufficiently characteristic. That this is not always the fact is shown by the following:

Case III.—A man, aged sixty, upon one side of whose larynx appeared three small papillomatous growths. Thyreotomy was performed and the interior of the larynx presented to view. Thus exposed to the light and under the most careful inspection, it still was impossible to detect any positive appearance of malignant disease. The growths having been

removed, microscopic examination easily established the diagnosis of epithelioma. The disease recurred shortly after this, and a highly successful extirpation of the larynx, performed by Professor William T. Bull, prolonged the patient's life for nearly two years.

It appears that epithelioma of the larynx not uncommonly is complicated with pulmonary phthisis (see note, Case VI). Indeed, a recent writer has called attention to the possibility of the dependence of the malignant disease upon the other. It is easy to understand that with the existence of the pulmonary lesion a thickening of the mucous membrane of the larynx not sufficiently well marked to excite the suspicion that it was malignant, might easily be mistaken for tubercular laryngitis, as is well illustrated in the history of—

Case IV.—John B., Ireland, aged fifty, married, porter. The patient applied for treatment at the College of Physicians and Surgeons, New York, October 15, 1882. Had always enjoyed excellent health; was not aware of any heredity; had been strictly temperate in the use of alcoholics, and regular in his habits; was a moderate smoker; gave no evidence whatever of syphilis. During the month of August, 1882, while employed as gate-keeper on the elevated railroad, first noticed a slight hoarseness of voice. This increased slowly, and soon began to be attended with a mild laryngeal cough. Soon afterward began to lose strength, appetite, and flesh.

When first examined, two months after the beginning of these symptoms, the patient appeared to be a fairly well-nourished man, of medium height and build, light complexion, and good intelligence.

Laryngoscopic examination, made with some difficulty by reason of a marked hyperæsthesia of the pharynx, revealed a condition which differed little from an ordinary chronic laryngitis. Both vocal bands were congested and thickened, the congestion extending throughout the whole interior of the larynx, but being most pronounced upon the left false cord, which was also slightly enlarged and prominent.

Examination of the chest showed physical signs of phthisis, first stage, at apices of both lungs.

By the middle of December following, the above-mentioned enlargement of the left false cord had progressed decidedly, and its surface, from being smooth and natural, began to be nodulated and uneven. This continued to such an extent that the presence of a new growth in the larynx, long before recognized and for some weeks suspected to be of a malignant type, could no longer be doubted. From this time it developed with increasing rapidity, following the usual course of epithelioma, which it was proved by the microscope to be, and finally ending with the patient's death. The autopsy showed advanced phthisis in both lungs.

Syphilis may readily be mistaken for malignant disease, even in cases where the appearances are in the main pathognomonic. This

accident is of such frequent occurrence that the importance of a tentative course of specific treatment can not be too strongly insisted upon. On the other hand, malignant disease has occasionally been mistaken for syphilis, an error by no means difficult to make in view of the apparently beneficial influence of the iodide of potassium early in the course of its administration upon the former condition. Indeed, it is a matter of somewhat common occurrence for the first effects of the iodide to be markedly salutary. Within a short time, as a rule, the deceptive character of this improvement becomes evident, and, in spite of the drug, the disease makes steady progress. Where the evidences of syphilis are actually present and the use of the iodide is followed temporarily by good results, the difficulties in the way of an early diagnosis of cancer are particularly great, as illustrated in the following:

Case V.—J. W. B., aged fifty-six, consulted me for neuralgic pain in the right lateral wall of the pharynx, from which he had lately been troubled. He stated that many years ago he had contracted syphilis and had suffered severely from ulceration of the throat. Had been somewhat intemperate and had been an immoderate smoker. Examination of the pharynx revealed partial destruction of the soft palate and numerous old cicatricial bands upon it and the posterior pharyngeal wall, which were characteristic of former specific ulceration. There was slight redness of the tonsil, which extended deeply into the pharynx, but absolutely no apparent indication of thickening or tumefaction. Under large doses of the iodide of potassium there was a slight but transient improvement. The pain, however, soon returned, and, although markedly improved by the local application of astringents and particularly of nitrate of silver, never entirely disappeared. A change in the character of the pain began to take place, and it became of a more distinctly lancinating character. Suspecting the possibility that the case was malignant, the patient was seen in consultation by one of the best diagnosticians living, who promptly and positively pronounced it specific.

The redness meanwhile spread below the tonsil and across the base of the tongue, and a gradual thickening of the mucous membrane, imperceptible at first but growing more and more distinct, began to take place. The diagnosis of probable epithelioma was made, but it was a long while before the appearances were such that it could be confirmed. Later one of the cervical glands became involved and ulceration of the mucous membrane adjacent to and outside of the larynx took place. The disease progressed, and death in the usual manner resulted. The points of special interest in this case are (1) the impossibility of early diagnosis; (2) the fact that the disease was diffused and that a widespread infiltration had existed from the outset; (3) that, in consequence, at no time in its his-

tory could an operation have been performed with any reasonable prospect of relief.

From the histories quoted above and in the light of general clinical experience, it appears that numerous variations in the typical course of malignant disease of the larynx are observed. Indeed, the most marked and constant of them are sometimes absent during the earlier stages of the difficulty and do not develop until the latter has made considerable progress. Even the common symptoms—aphonia, cough, dysphagia—may at first be wanting, while the appearance of the growth and the general history of the case are often misleading throughout the earlier stages and do not reveal the true character of the disease until the case has become helpless. Again, pain of lancinating character, almost invariably present, will sometimes not appear early in the history of laryngeal epithelioma, particularly, according to Mr. Lennox Browne, where the growth is intralaryngeal and unilateral.

Swelling of the cervical glands is often absent in the earlier stages and may be of such late occurrence as to be useless as an early diagnostic sign, while secretion and well-defined deformity may be entirely absent for a considerable length of time.

In view of these things, it remains to us to study the value of means not fully recognized and accepted, to test the worth of whatever new suggestions may be made in this direction, and to seek to discover efficient methods hitherto untried.

Of the first-mentioned class of methods, thyreotomy is the one most likely to challenge attention. By means of this operation the larynx may be opened and its interior fully exposed to view. Even under conditions thus favorable for the careful and accurate examination of the tumor, it is not always possible to establish the diagnosis, as was seen in Case IV, unless through the removal of the growth and its examination under the microscope, a somewhat severe procedure.

The objections to thyreotomy, therefore, are (1) the magnitude of the operation, and (2) the possibility of finding a benign growth after all. Three other and less radical aids to diagnosis have lately been advanced. The first two are based upon the pathological appearances; the third is mechanical.

1. Thickening of the mucous membrane, with marked loss of motion in the neighborhood of such thickening, implies an infiltration of the muscles which, it is said, is generally due to malignant disease. An apparent paralysis of one side of the larynx, associated

with thickening upon the same side, should always call for extreme caution in the matter of prognosis.

2. As the result of numerous investigations made during the last two years, it is held by many that of new growths of the larynx, those that are papillomatous in form and the bases of which are not surrounded by a zone of inflammation are probably benign, while those which are encircled by a ring of reddened, infiltrated membrane are almost certain to be malignant. The truth of this assertion has been verified in several instances by the writer, although, on the other hand, he has found that it is not constant and, therefore, that it can not be depended upon.

3. Translumination of the larynx, first suggested by Voltolini, has been studied of late by several observers. While, by the use of the electric light applied to the exterior of the larynx, the writer has found it possible to gain tolerably satisfactory results in causing the light to penetrate the walls of the larynx, it would hardly be possible by this method to recognize the presence of an abnormal thickening which was not already sufficiently well developed to be visible to the eye by the ordinary intralaryngeal demonstration. As a means of recognizing the presence of a new growth of recent origin and of small extent, this method is at present of doubtful value. For the purpose, however, of demonstrating the relative density of an enlargement of appreciable size, translumination of the larynx is a method of considerable importance; and even in cases of the class first mentioned it may occasionally be found useful. At least it should not be entirely condemned, since it is yet in its infancy, both as regards the apparatus used and as to the skill of those employing it, and it may in the future be so perfected as to become of practical importance.

Thus, in conclusion, it will be seen that while, in cases of laryngeal cancer, all of the classical symptoms will ultimately appear, and that, as a rule, they are present from an early period, the point aimed at by this article is to demonstrate that they may be postponed until the disease has passed the stage in which it may be regarded as possibly remediable, and thus offer no real aid in the saving of the patient's life.

The presence of muscular infiltration; the occurrence of a reddened areola around the base of the tumor, if indeed the disease present itself in the form of a tumor having a base; the appearances developed by the use of transmitted light—all of these, although uncertain reliances, do add in some measure to our scanty resources,

and, together with the general history of the case, the ordinarily recognized symptoms, objective, subjective, microscopical, and therapeutical, and, finally, with the training of the judgment which comes to the experienced observer from the study of many examples, enable us in most instances to determine tolerably early the true character of the disease. Nevertheless, since the only hope of saving the life of the patient may depend upon the earliest possible performance of an operation, it is evident that with the above-mentioned diagnostic resources we are still, in spite of recent allegations, far behind in the knowledge necessary to the early recognition and the successful radical treatment of malignant laryngeal disease.

NOTE.—Since writing the above we have seen a case which so fully corroborates what has been said above as to make it worthy of publication.

CASE VI.—V. V., aged sixty-six, farmer, family history excellent, health and habits perfect, a man of fine physique and remarkably well preserved. Two years before this examination, began to notice aphonia. One year later consulted an eminent specialist, who found a well-defined tumor, a quarter of an inch in diameter, upon the middle of the right vocal band. The aphonia continued, and in time dyspnœa appeared. This became severe and forced him to seek relief. Laryngoscopic examination revealed the presence in the larynx of a large tumor. This seemed to spring from the right ventricle of the larynx, its base extending from the anterior to the posterior commissure, and below the vocal band indefinitely into the subglottic region. Its shape was somewhat spherical, its diameter about an inch, and its surface uneven and dark-colored. It filled about two thirds of the intralaryngeal space, and materially lessened the rima glottidis. The limit of this growth, as seen by the laryngoscope, was absolutely well-defined, and there was no areola visible. The adjacent arytænoid eminence was distinctly normal, corresponded exactly with its fellow, and showed neither tumefaction nor loss of motion, the excursion of the joint being perfect. There was entire absence of lancinating pain. There was no glandular involvement, and no external deformity of the larynx. The appearance of the growth itself was that of epithelioma. Corroborative evidence in the surrounding parts entirely absent. Microscopic examination showed epithelioma.

Discussion.

The PRESIDENT: This is an exceedingly important subject. Upon the early diagnosis the life or death of a patient may depend.

DR. DALY: This subject is certainly an important one—not only involving questions of diagnosis of a very interesting character, but the safety and happiness of our patients. I may say at once that I am not very favorable in these cases to much interference unless of a radical surgical character. I think that there comes a time when a benign sore becomes irritated by harsh interference, and, where the conditions are predisposed, may be made malignant by such harsh interference. We want to learn more about this point and how to avoid this dread evil.

have no very pronounced views of treatment, except that I am not an advocate of extirpation of the larynx; it is a ghastly operation, the result is not happy for the patient, and statistics do not prove that it is justifiable.

Dr. INGALS: I would ask what the difference is in the appearance of the parts, in transillumination of the larynx, between a benign and a malignant growth.

Dr. DELAVAN: The only use to which transillumination can be put is to demonstrate a cloudy area around the growth corresponding with the amount of infiltration, which, of course, would not exist in benign lesions. In the normal larynx the electric light transmitted in this way gives a rosy illumination of the parts with a certain definite distribution of the lights and shadows. If one side of the larynx is invaded by a growth, and its appearance is contrasted with that of the healthy side by transillumination, the difference will be perceived. Where there is exudation or infiltration, the conducting power of the tissues is much diminished. Of course, by this method no fine diagnosis is possible, but it may be of some assistance in making a diagnosis between a simple condition of tumefaction and the actual presence of a new growth, although, of course, other means would be required to confirm it. It would determine whether the transparency of the tissues is normal, and, if not normal, the extent of the lesion. The mode of applying it is very simple. An electric lamp is attached to a cylinder of solid glass which may be as long as convenient, two inches being sufficient. The light is focused at a spot at the end of the cylinder, which is placed directly against the larynx, externally to the point to be examined. A lamp of three or four candle power will afford a brilliant illumination. Of course, the relative thickness of the wall of the neck will affect the light, in a stout person the amount of light transmitted being less than in a thin one. The light being placed directly below the cricoid, a good illumination is afforded in average cases.

Dr. INGALS: Would the transillumination of a malignant growth make it appear very different from a benign tumor? I can see that there would be a difference, for instance, between a cyst and an ordinary infiltration, but I can not understand why there could be much difference in appearance between a simple inflammatory exudation and malignant disease. I am much interested in the discussion of the early diagnosis between lupus, syphilis, and malignant disease, because of a case that I saw early this past winter. The patient, about twenty-two years of age, married, came to me breathing with much difficulty, the right ventricular band much thickened, the cord scarcely visible, owing to the swelling above it. I introduced a large-sized O'Dwyer tube, which she wore for several days; I then removed it, and breathing was perfectly easy. I afterward examined her larynx and found two or three small nodules protruding from the ventricle, having the appearance of a papillary growth. The patient afterward had *la grippe*, followed by typhoid fever. I did not see her again for two or three months, during which time trache-

otomy had been performed. When she returned there were no distinct nodules at the orifice of the ventricle, but general thickening of the right side of the larynx, particularly in the region of the false cord, which might have been accounted for by a simple benign growth within the right ventricle.

The difficulties of diagnosis are well illustrated by a case that I treated some years ago, that had been under the care of the late Dr. Elsberg and another prominent laryngologist, I do not remember whom. One had pronounced it a cancer, the other not. I found extensive thickening which certainly had a malignant appearance. No possible evidence of syphilis could be found. The iodides were tried, though without much effect. He remained in much the same condition, and I think is still living.

Dr. Holden: I should like to ask if I understood the author correctly in stating that one of the points of diagnosis was that the zone of redness surrounding the growth was characteristic of malignancy. I recall the case of a gentleman who came to me some time ago, and entirely recovered after antisyphilitic treatment. The character just mentioned —of a zone of redness—was well marked in this case. I have seen other cases in which the zone of redness existed in non-malignant growths.

Dr. Asch: My experience is that cancer of the larynx is comparatively infrequent; but I can not recall that in the cases I have seen there was, as a rule, any diagnostic peculiarity in the appearance at the outset. There is nothing to indicate malignant disease. There is first swelling in the larynx without any redness, and no change in the external appearance of the mucous membrane. Most of my cases were well developed when they presented themselves. I usually fall back upon the classical way of diagnosis by treatment. If the growths yield to syphilitic treatment, they are not cancer. If we could diagnosticate these cases early, it might be possible to save life by operation. I do not understand that Dr. Delavan gives anything which enables us to make this early diagnosis except the reddened zone of infiltration. We can exclude lupus and tubercle, because in them the appearance of the mucous membrane is changed and they are located differently. The cases of cancer I have seen have not occurred in the posterior part of the larynx, but elsewhere.

Dr. Mulhall: I wish to corroborate the point made by Dr. Daly, which is of great interest. I have had two cases of cancer of the larynx, which greatly improved under iodide of potassium for a time. I also wish to remark that we should be very careful of our prognosis in cases of suspected cancer of the larynx. I recall a case seen by an eminent laryngologist and pronounced a case of undoubted malignancy. There was paralysis of the muscles of the larynx, aphonia, the patient was losing flesh, and strength was failing. I saw the case a year later. The patient came to me completely aphonic with this same growth. The treatment proved that it was a case of chronic laryngitis, limited to one side. The treatment consisted in applications of solid nitrate of silver for

the reduction of infiltration, and the galvano-cautery to the growth. Her voice returned, and she went home much relieved in body and mind. Therefore I remark that we should be careful in the diagnosis of cancer of the larynx. I quite agree with Dr. Daly that the operation of extirpation of the larynx is unjustifiable.

Dr. SWAIN: I wish to remark upon the infiltration and the consequent immobility of the parts involved as a point in the diagnosis of malignancy. In a recent case which I recall there was a diagnosis to be made between cancer of the larynx and infiltration due to perichondritis or tuberculosis. With very little hesitation, owing to the mobility of the parts and non-involvement of the vocal cords, I decided that it was non-malignant. The subsequent course of the disease showed it to be a simple perichondritis with abscess, which was evacuated, and the patient is now better.

Dr. BOSWORTH: It is very interesting to listen to a paper which considers practical points, such as diagnosis or treatment. In addition to the points mentioned, there is yet another which has not been named—it is the diagnostic instinct which enables us to look at the case comprehensively and say that this is a case of cancer, or this is not malignant.

Dr. LANGMAID: Some years ago I supposed that cancer of the larynx was comparatively frequent. I do not now believe it to be rare. Two diagnostic points occur to me which may be of interest. When you see the growth early you find infiltration, the lumen of the glottis is diminished, and its general aspect is changed. The other point is the occurrence of a stabbing pain in the ear; it comes early in the disease.

Dr. DALY: A further word I would say with regard to a subject of importance to laryngologists. It is a word of injunction as to the use of irritating local applications while the case is still being studied. I have in mind a very glaring case of malpractice where the patient was burned with the galvano-cautery every day for seven or nine days, sufficient of itself to develop cancer of the larynx, where the germs were already budding. If our case is one of cancer of the larynx, irritating measures short of total destruction or extirpation of the affected tissues do no good; if it is not cancer of the larynx, we have only to await developments. But if interference is practiced, let it be by early ablation or extirpation of the suspected tissue, and only by the knife and not the cautery.

Dr. INGALS: With regard to the treatment of cancer in the throat, I have been fully convinced that the application of carbolic acid, tannin, and glycerin has given much relief to patients for whom at best we can do but little. I think that, applied in this way, tannic acid hardens the tissues, and thus prolongs the anæsthetic action of the carbolic acid. I use for this purpose a combination of morphine four grains, tannin and carbolic acid each thirty grains, in four drachms each of glycerin and water.

The PRESIDENT: During this discussion the question of the rarity of cancer of the larynx has come up. As far as my own experience goes, I have seen very few cases in this city (Baltimore), but abroad, especially

in London, it seems to me that the disease is more common. With regard to extirpation of the larynx, I do not think it an unjustifiable operation, because many lives have been saved and prolonged by it. The startling results in the experience of Hahn make us believe that we may have to look upon this operation as one to be more frequently used than it is to-day. There is one form of hypertrophic laryngitis where the membrane becomes very much thickened. Such a case might possibly be mistaken for incipient carcinoma. The fibroid degeneration of the larynx in tertiary syphilis might also be mistaken for the early stage of carcinoma, especially as on this affection the iodides do not have the slightest effect. These cases drift on to the performance of tracheotomy as the only hope of relief. In such a case, if ulceration takes place, the lesion might very readily be taken for cancer, and this mistake has very probably been made. One feature which increases the liability to mistake is the early swelling of the lymphatics of the neck. We all know that the main rendezvous for the lymphatics coming from the larynx is at the cornua of the hyoid bone. Strange to say, even in some of the worst cases of tuberculosis of the larynx, and of syphilis of the larynx, these glands have not been found affected. When enlarged, they can readily be felt by deep pressure in this locality. They become enlarged in cancer of the larynx at a very early day more frequently than is generally taught. Although this is not diagnostic, yet if I found in a suspicious case, at the cornua of the hyoid bone, a mass of enlarged indurated glands, I should consider it probably malignant. An old gentleman was brought to me the other day for me to decide upon the propriety of extirpation of the larynx. The diagnosis was very difficult, and lay between cancer and tuberculosis. Something in the appe..rance of the growth suggested the idea of malignancy. His physician reported to me that he had also a cavity in the apex of the right lung. He had a number of glands enlarged in the superior cervical triangle, exceedingly hard and flattened. Tracheotomy had been performed, but the tube had been removed, as the obstruction had become less since the operation. On the strength of the appearance of the larynx and the nodules on the outside, I made a diagnosis of cancer of the larynx with bronchial dilatation on the left side, asking for two weeks' time in which to change it if I thought fit after further observation. I also warned against the danger of sudden œdema, and advised a second tracheotomy. I am now awaiting developments.* The case is hopeless in any event, and the proposed operation is out of the question. We do not know how far the infiltration may extend, and even extirpation of the larynx might fail to remove it all. Any growth proceeding from the ventricle upon

* Since this was spoken the patient has died, death occurring suddenly from laryngeal œdema, the operation not having been performed. Microscopical examinations showed the laryngeal and cervical growth to be cancerous. On dissection, there was extra-tracheal cancer, with considerable pressure on the windpipe. There was also left bronchial dilatation.

either side is a suspicious one, for this is the most frequent mode of invasion of the larynx by malignant disease. I think that Dr. Daly is a little too severe upon the use of the galvano-cautery. It certainly destroys tissue.

Dr. DALY: Not necessarily; it depends altogether upon how it is used. It will at a white heat destroy tissue, but at a dull cherry-red heat it only stimulates and is not caustic; its action is only superficial. The parts become the seat superficially of an acute inflammation which is rapidly followed by absorption.

The PRESIDENT: I am thoroughly in accord with Dr. Daly about the harsh treatment of any disease, whether seated in the larynx or not. One point of historical interest I might refer to; Voltolini is supposed to have been the first to suggest transillumination of the nasal cavities and the antrum of Highmore. I would call your attention to the fact that the second year that I was a member of this society I proposed this method. Two years before, the S. S. White Dental Manufacturing Company, of Philadelphia, had submitted to me, for examination, an instrument for transilluminating the larynx with an electric lamp. This instrument had been before the public for some years, and was in use by American dentists to detect caries of teeth by transillumination. I am not positive whether or not this had been used for the antrum of Highmore, but it certainly had been used for examining the mouth and teeth. The suggestion was made that it might be useful for transillumination of the larynx. I did not think that it possessed much value for the larynx, but thought that it would be valuable in examining the nose. It was a small Edison light which gave the illumination. As a result of my observations, I proposed this method in the diagnosis of antral disease and deep-seated lesions in the nasal passages. I might also say, in justice to another member of this society, that at the same meeting Dr. Carl Seiler, of Philadelphia, said that he had tried this method of illuminating the larynx, but that he had given it up, I believe, because it burned the patient's throat.

Dr. SEILER: My objection was that there was no shadow, as in the ordinary method of illumination, and the distinction between projecting parts and the rest of the larynx was lost. The whole inner surface glowed with a dull-red light, which was not sufficient for careful examination.

The PRESIDENT: I simply mentioned these facts to show that Voltolini was not the first to pursue this method of examining the larynx and nasal passages.

Dr. DELAVAN: The object in bringing this communicationbefore you was simply because, of all the practical observations resulting from the searching investigations lately made in this department, these alone seemed to be of any value. Thickening and infiltration are certainly of diagnostic value. The reddened zone, a point to which attention has been called by several German writers, and which I also have observed in several cases, is not without a certain amount of significance. My inten-

tion, however, was simply to bring it forward for discussion and consideration.

With regard to extirpation of the larynx, its success depends very largely upon the selection of the case and upon the operator. Some few men can perform it and do it well, whereas with others failure seems to have resulted from lack of experience in the operation itself, or from lack of care in the after-management of the patient. In the case I have referred to the patient lived for several years and was comfortable. Several years ago, before the statistics of recent operations had been published, Dr. C. H. Knight, of this association, read a paper in which he stated that the propriety of the operation must be decided by the statistics. Since then statistics have accumulated, and we are in a better position to judge as to the actual value of the operation.

The points of diagnosis which I referred to were not positive but suggestive. There is, as has been said, a training of the observation by which we may be enabled to strongly suspect malignancy without being able to say upon what the opinion is based—something about the locality and appearance which stamps its character upon it.

With regard to the astringent applications mentioned by Dr. Ingals, I have found them of decided value; they afford great relief to pain in swallowing, and I think that they sometimes delay the development of the growth. They can not have much effect upon the deeper portions, but they appear to harden the surface and protect it. I have seen a great many cases of cancer of the larynx in the last fifteen years in private and hospital practice, and believe that in our city (New York) it is not such a very rare disease. The swelling of the glands of the front of the neck which has been mentioned may be found in other lesions. It may be absent in cancer, especially early in the case. Finally, if the paper has succeeded in demonstrating the poverty of our resources in the early diagnosis of laryngeal cancer, and if it will serve to stimulate investigation in this direction, it will have been of some use. Certainly, little substantial has been learned from the much-discussed case of the late Emperor of Germany.

Paper.

THE CONDITION KNOWN AS "CHORDITIS TUBEROSA."

By CLARENCE C. RICE, M. D.

THIS pathological condition of the vocal apparatus is of interest to the laryngologist because it occurs frequently in public speakers, singers, and actors. It always produces some degree of impairment of the voice, and, as it is a lesion which it is difficult to eradicate, it is well to appreciate its existence and to treat it intelligently.

Not much has been written about it. Most authors have been satisfied with brief mention of this condition as one of the manifestations of chronic catarrhal laryngitis.

Türck's* description of this lesion, to which he gave the name "chorditis tuberosa," is comprehensive. He says he had noticed four cases of this peculiar inflammation of the vocal bands in singers, and he gives this description of the appearance of the larynx: Midway in the upper plane of the bands there is a peculiar uneven surface, and, in addition to redness and swelling, some white opaque spots as large as poppy seeds. These white spots, he says, become more noticeable as the general congestion subsides. He believes this peculiar lesion to be due to inflammation of the mucous glands.

It is somewhat difficult to determine whether Virchow† is not describing the same pathological condition in his article on Pachydermia of the Larynx. Certainly the appearances of the vocal bands in the earliest stages of pachydermia, as Virchow sees them, are quite similar to the nodules of chorditis tuberosa. Later the infiltration and swelling are much greater in what he designates pachydermia than we see in chorditis tuberosa. According to Virchow, the condition occurs in aged drinkers and is caused by shouting. He says the swelling is at first localized in the middle of the vocal bands. There are raised points with tissue-thickening about them, the raised points being the swelling of the squamous epithelium and the papillæ. The surface of the affected band or bands is covered with a whitish membrane consisting of proliferating epithelial cells. The process he believes to be due to long-continued congestion, not an irritative one—a hyperplastic process. He thinks it can not consistently be called a chronic catarrh of the larynx, as there are neither mucus nor pus-corpuscles. In his description of the later appearances of the larynx we do not recognize any similarity to chorditis tuberosa. I am not familiar with chorditis tuberosa in "aged drinkers." My cases have all been in young adults and in singers of temperate habits. And the thickening extending from the vocal bands, both above and below, forming polypoid enlargements, as Virchow pictures the later lesions, I have not seen in chorditis tuberosa. Virchow's pachydermia, in its later stages at least, resembles much more closely that trachomatous or scleromatous condition of the vocal bands seen in long-standing cases of chronic catarrhal laryngi-

† Türck, *Klinik der Krankheiten des Kehlkopfes*, Wien, 1866, p. 164 (or s. 204).

* Virchow, *Verhandlung der Berlin. med. Gesellschaft*, reported in *Berliner klin. Wochenschrift*, 1883, No. 21.

, occasioned by excessive drinking and smoking, and in which strong astringent applications have been liberally employed.

While it is true that in a small percentage of the cases which come under observation this nodular enlargement on the vocal bands develops at a late stage of a chronic catarrhal process of the larynx —a secondary hypertrophy following a long pre-existing congestion of the vocal bands—far more frequently, I believe, the nodular enlargement is primary, and the congestion and thickening and failure of approximation of the vocal bands is secondary.

The irritation caused by the constant friction of the nodular enlargement with the opposite band, and the extra exertion necessary to produce a true tone in singing or a clear voice in speaking—these cause a form of traumatic congestion with hyperplastic changes, and eventually an exhaustion of the adductors and tensors of the bands.

During the last two years I have seen eight cases of chorditis tuberosa. Six of these cases were in singers; the remaining two cases were in people who used their voices more than in ordinary conversation—one a Hebrew, who read aloud some religious ceremony every week, and the other a foreman of a large number of laborers, who was in the habit of shouting to his men. The six singers were all women and sopranos. It would be interesting to know how many cases of chorditis tuberosa have been seen in people who do not sing or who do not use the voice except in ordinary conversation. I have never seen such a case. This may be due to the fact that none but singers, actors, public speakers, etc., go to a physician on account of the moderate hoarseness which the nodule on the vocal band produces. It is my belief, however, that this nodule is produced by excessive use of the voice in singing and public speaking, and that it is attributable largely to *a faulty method of singing, or a bad manner of using the voice.* It is a significant fact that six of the eight cases observed were singers and sopranos, where, as we know, the highest tension and the most rapid vibration of the bands are required during singing. In writing the histories of these six cases, I paid some attention to the manner in which the voice had been used, and it seemed to me significant that two of the patients, young women of twenty years, were in the same class at a grand conservatory of music where only the true Italian method was taught. During vocalization in both of these cases, as the scale was ascended, the epiglottis was carried farther downward and backward with each note and the larynx was compressed more and more. One of these women could sing only a short time without becoming quite hoarse. After

changing her teacher and using her voice in a different manner, she could sing and does sing every night at a theatre, and sings fairly well too, and there is still some nodular enlargement on one of the bands.

One of my six patients—an operatic singer of great reputation—stated the pathology of the condition known as "chorditis tuberosa" quite accurately when she said, after I had described to her the laryngoscopic appearances, "Why, I should say I had corns on my vocal bands." And that I believe is the pathological condition which is present in these cases—a "dermoid metamorphosis," as Ziemssen* puts it, the trachomatous condition alluded to by Mackenzie.† Wedl, who examined a number of specimens microscopically, found only connective-tissue hypertrophy with heaps of nuclei. I have had sections from two nodules examined, which were removed from the vocal band by a small snap guillotine, and the result, which was the same in both cases, was connective tissue and epithelial elements in largely increased numbers.

These nodular enlargements are produced by the friction of the free edge of one band against that of the other where the voice is used a great deal, and where the tension of the bands is unevenly controlled because of a faulty method of using the laryngeal muscles; just as the outer layers of the skin of the foot are hypertrophied by the friction of an ill-fitting shoe. Contrary to the teaching of many writers, I believe that the nodular enlargement is the primary lesion; and the pathological appearances of the bands which follow—such as congestion and general thickening, by reason of which these cases have been improperly classed among those of chronic laryngitis—these are secondary lesions and are directly dependent upon the nodular enlargement.

"Chorditis tuberosa" should not be confounded with the uneven surface of the vocal bands seen in long-standing cases of simple chronic chorditis, where the vocal apparatus has been abused for many years, and strong astringents or caustics have been so frequently applied to the larynx that little normal mucous covering remains.

The terms "trachoma" and "scleroma" are more appropriately applied to the uneven, rough, granular condition of the vocal bands, as seen in the above cases, than to the condition known as "chorditis tuberosa." Chorditis tuberosa may be the cause of a general

* Ziemssen, *Cyclopædia Practice Med.*, vol. iv, p. 217.

† Sir Morell Mackenzie, *Dis. of Throat*, vol. i, p. 294.

trachomatous condition. Chorditis tuberosa should also be differentiated from the cicatrices of tubercular and syphilitic ulcers or from granulation tissue springing therefrom, and also from benignant growths attached to the vocal bands.

The nodular enlargements may be situated upon one or both bands. In five of the eight cases I have seen, the nodule was on the left band. It is usually located a trifle more anteriorly than midway between the vocal processes and the anterior insertions of the vocal bands. (Fig. 1.) And it is probable that at this point the friction between the bands is greatest. A nodular enlargement on one band, if the voice is persistently used in singing or speaking, in time produces some alteration in the tissue of the other band at the point of contact. Sometimes there is an appearance of depression in the vocal band just opposite the nodule into which the protruding point fits. (Fig. 2.) If this depression is examined carefully, the covering will present a roughened appearance, a callous spot which has been produced by the protruding point on the opposite band. This callous depression is really raised above the normal surface of the vocal band; but a concavity exists because the edges about the depression are elevated to a still greater degree. After the nodule has existed for some time the depression on the second band is sometimes filled, and later gives place to a second nodule. Two nodules are now seen striking against each other, and the bands are by just so much more prevented from approximating during phonation. If

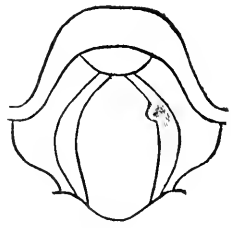


Fig. 1.

Fig. 2.

these nodules are not removed, and if the person is allowed to continue singing, the irritative friction and the increased effort of the intrinsic laryngeal muscles necessary to bring the bands together cause a congestion and thickening of the entire substance of the bands, which it will be very difficult to dissipate by the most judicious of local treatment. If a very careful examination of one of the nodules is made in its earliest stages, the mucous membrane covering

it will seem to be unaltered, and the millet-like nodule seems to be wholly situated in the substance of the band, and, as it develops, pushes the mucous membrane in front of it.

In one of my cases I found the nodular enlargement associated with the condition known as chorditis inferior hypertrophica. The nodule was probably primary and was the cause of the subglottic thickening.

The sole symptom of this condition is at first impairment of the voice, the degree depending upon the size of the interposing nodule and the secondary or resulting inflammatory changes in the vocal bands. The degree of hoarseness in singing will also depend upon the skill with which the vocal apparatus is employed. We all know how well some singers vocalize with greatly altered vocal bands.

In no laryngeal disorder must the treatment be more painstaking. Skillful manipulation will be required to eradicate the condition known as "chorditis tuberosa." These cases should be treated as early as possible before the second band has been injured by the protruding nodule on its fellow, and before the bands have become congested, thickened, and stiffened, and the vocal tensors exhausted beyond recovery. These patients should not be allowed to sing or to use their voices except in quiet conversation. There should be no exception to this rule. The patient must rest not only until the nodular enlargement is smoothed down, but until congestion has abated and the muscular tone of the larynx is restored. Hoarseness quickly returns if the patients are permitted to use the voice when they are only half cured.

The local remedies are not many which are of use in the judicious treatment of chorditis tuberosa. The nodule must be eradicated first of all. Time can be saved in some of these cases where the nodule is large enough by snipping it off to the plane of the free edge of the band. I have used successfully a small circular snap guillotine knife, the circle about a quarter of an inch in diameter. With the aid of cocaine this circle can be placed around the nodule and the band pressed up against the lateral wall of the larynx before the knife is sprung. This instrument can be used more delicately than a laryngeal forceps and with less damage to the bands. After the nodule has been cut off even with the surrounding surface I have found a solution of zinc chloride, from twenty to forty grains to the ounce, of more benefit than the silver solution, in that it heals the ulceration left by the knife with far less cicatrization than does the silver. A thirty-grain solution of zinc chloride applied exactly to

the base of the nodule after its excision has, in my experience, prevented its regrowth. A milder astringent solution, either ten grains of zinc or silver, should be used at home by the patient every day for weeks. When the entire substance of the bands is congested and thickened, absorption can be more rapidly effected with a solution of iodol or iodoform in ether (℥ j to ℥ j) than with astringents. Cocaine as an astringent has not received the credit it deserves. A two-per-cent. solution used twice daily does more than temporary good by expelling the blood from the bands. The faradaic or galvanic current will be useful and necessary in restoring tone to the laryngeal muscles. Finally, after the bands have been made as nearly normal as possible, we should insist that our patient, if he is a singer, put himself under the instruction of a proper teacher. We can easily learn the names of those teachers who have developed successful singers, and we can warn our patients against the instruction of those teachers whose pupils can never sing without becoming hoarse. This advice is imperative if we would cure this class of patients. A faulty method of using the voice will bring back in a short time the catarrhal conditions which we may have been months in curing, and even the nodule itself. As it is necessary after an operation for strabismus that a patient should be fitted with glasses which will correct the error of refraction that has occasioned the necessity of cutting the ocular muscles, so it is imperative that we should forbid the continuance of that faulty manner of using the voice in singing or speaking which has occasioned the nodular enlargements on the vocal bands.

The points I would place emphasis upon are these:

1. The condition known as "chorditis tuberosa" is not always or often one of the pathological changes to be classed among those of chronic catarrhal laryngitis, but it is itself the primary lesion.

2. The presence of this nodule is the direct cause of the catarrhal changes in the larynx which appear later.

3. This condition is almost always found in singers or public speakers, and is occasioned to a great degree by a faulty method of using the voice—a callus occasioned by attrition of one band against the other.

4. Chorditis tuberosa occurs more frequently in women than in men, and is seen most often in sopranos.

5. A nodular enlargement will in time produce change in the second band at the point of contact, and

6. These nodules should be removed as early as possible, singing

should not be allowed until the bands are normal, and faulty methods of using the voice should be forbidden.

Discussion.

Dr. WESTBROOK: I recall the case of a lady about forty years of age, who I do not think was a singer, certainly not an opera singer, although a great talker, who had the condition which Dr. Rice has just described upon the left vocal band. She had a nodule situated near the junction of the posterior and middle thirds, growing from the vocal process forward. I treated it almost entirely with the fifty-per-cent. solution of nitrate of silver. The growth diminished gradually under the treatment, and was much reduced when she deserted me and went to another physician. The last that I heard of it was that it was still shrinking. I think that the same plan of treatment was pursued by the physician to whom she went. I mention this case because it occurred in a person not a singer.

Dr. DALY: The few cases of this disease that I have treated have been, with only one or two exceptions, in patients with tuberculous tendencies, either inherited or acquired. They all belonged to families in which one or more members had died with tuberculous consumption. One very striking case was under my care for a year and a half at intervals, and yielded to persistent applications of strong solutions of iodine. The nodules were absorbed, gradually disappearing, and the vocal bands were revealed clear and white; but after some three or four months there was a return of the disease. In the incipient form I find a mere film of material easily brushed off with a probang, or a piece of cotton on an applicator. While I have never seen a case where the patient used his voice in singing, yet one of the cases I refer to was fond of talking a great deal—a seamstress by occupation; I believe that she is in good health now. I have not seen or heard of her for two years. My opinion is that these cases are curable, and without any severe operation. I have once removed these nodules by scraping with my forefinger nail, or by slightly irritating the cords absorption is favored. I would make the remark that in tuberculous families this condition of the larynx is not uncommon. [As I am revising this note I learn that this patient alluded to died of laryngeal phthisis three months ago.]

Dr. DELAVAN: I have observed this condition most frequently upon the right side of the larynx, and in females. Applications of solutions of iodine have given good results in such cases. A few years ago it was recommended to force a probang covered with cotton through the glottis, in the hope that the granulations might thus be scraped away. I have not found this method a success. I would ask the reader of the paper to describe the instrument which he uses, and to state whether or not there would be any probability of injuring the delicate free border of the vocal cords as a result of its use.

The PRESIDENT: We should distinguish between a mere granular condition of the vocal cords and the genuine chorditis tuberosa as described by Türck. In the first, by the application of strong solutions, such as iodine, a cure can be effected. In the second case, where the whole cord is converted into a band, like a granular lid, they can not do much good. I also doubt very much, from physiological considerations, whether much good could be done by operation. The whole structure—all the tissues—are in a hypertrophied condition. I doubt even if we were to remove the granular surface, whether the cord would be restored to its functions, as in the case of a singer, for example. The condition of granular cord is occasionally seen in singers and public speakers; but experience shows that the condition of chorditis tuberosa is usually met with in the lower walks of life, among hospital and dispensary cases, and is usually incurable.

Dr. RICE: I have never noticed the relation between these growths and tubercular disease which Dr. Daly speaks of. My patients have been very healthy people. I can not even recall a tubercular family history. I do not think it is easy to confound these cases with old ulcerated conditions of the vocal bands due to tubercular deposits followed by ulceration and granulation. I have seen chorditis tuberosa almost always in singers, and I believe that the general infiltration, thickening, and appearances of chronic inflammation in both bands are the result of using the voice after the primary nodule has formed. It is difficult to restore the voice in singers if the nodule has been present for a long time and has caused general thickening, but when the case is seen early the prognosis is very good. Proper instruction in correct vocal methods is very important in these cases. In answer to Dr. Delavan, I use a small snap guillotine which I have modified so as to reach either the anterior or posterior commissure of the larynx as well as any part of the vocal bands. It is only possible to take hold of the protruding part of the growth; it is not possible to injure any part of the vocal bands with this instrument. The after-treatment consists in resting the voice and the application of appropriate astringents to the larynx.

Paper.

STRICTURE OF THE ŒSOPHAGUS FROM INTERSTITIAL THICKENING OF ITS WALLS; A FIBROID HYPERTROPHY.

By JOHN O. ROE, M.D.

AMONG the numerous pathological causes that produce contraction or stricture of the œsophagus, interstitial thickening of its walls is of the rarest occurrence.

So rare is it, that by many observers its occurrence is doubted.

Fibrous growths have been found in the walls of the œsophagus like those that are found in the uterus or other parts of the body; but I have been unable to find reported a case of interstitial thickening of the walls of the œsophagus where the diagnosis was confirmed by a thorough microscopic examination. Cases are reported where the constrictions of the œsophagus were believed to be due to connective-tissue thickening, but the absence of a microscopic examination renders these observations valueless. The following case, which is in every respect a typical one, can not, therefore, fail to be of special interest.

Mrs. M. A., fifty-eight years of age, was referred to me April 14, 1887, on account of a great difficulty in deglutition from which she had suffered for three months. During the first week in January she began to have much difficulty in swallowing. This difficulty increased slowly until, by the last week in March, it had become impossible for her to swallow any substance whatever. She was at first unable to swallow liquid and solid substances, but moistened semisolid substances she could swallow quite readily. She began about this time to have considerable pain in the back and sides of her neck, and the cervical lymphatics became enlarged and painful. She also expectorated a considerable amount of muco purulent material.

In the early part of March she was treated by a physician for this obstruction to deglutition with gum-elastic bougies. There was some improvement in swallowing directly after the use of the bougies, but the obstruction soon became as great as before, which necessitated daily dilatation of the œsophagus in order that she might take sufficient nutriment to sustain her. In a short time dilatation of the œsophagus was discontinued, and she was sustained by rectal alimentation. Shortly after this she passed into the hands of another physician, the one who referred her to me.

On examining her throat, there was nothing abnormal to be seen about the pharynx, but in the larynx there was a chronic laryngitis, rigidity of the arytænoid articulations, and almost complete immobility of the vocal bands, which were separated about three millimetres from each other, and afforded sufficient breathing space only when she remained perfectly quiet. The slightest exertion would cause great dyspnœa. On attempting to swallow, substances would drop into her larynx and cause more or less strangling. This was due to the rigidity of the larynx and its inability to close during deglutition.

On examining the œsophagus, the largest instrument I was able to pass was a flexible, conical-shaped bougie, No. 13, American scale. With a small olive-pointed, demi-bulbous bougie I determined that the contraction was cylindrical in shape and projected equally on all sides. It began about two inches below the entrance of the œsophagus and extended

for a distance of about two inches, being narrowest in the middle portion. Dilatation gave some slight improvement in deglutition, but not sufficient to enable her to take enough nutriment to sustain her. She had at this time become so weak that she was unable to walk alone. The nutritive enemata were no longer sufficient to sustain her, as they had ceased to be retained. In order, therefore, to administer sufficient sustenance, a small gum-elastic catheter was introduced twice daily, and about a quart of beef tea, eggs, and cream mixed together were injected into the stomach. Oil inunctions were also employed. Notwithstanding this, her debility increased, and on May 1st she died. Her death was evidently due to asthenia.

On post-mortem examination, there was found the condition of rigidity of the arytænoid articulations already described, and a general thickening of the tissues throughout the larynx. There was, however, no swelling of the arytænoids indicative of tubercle.

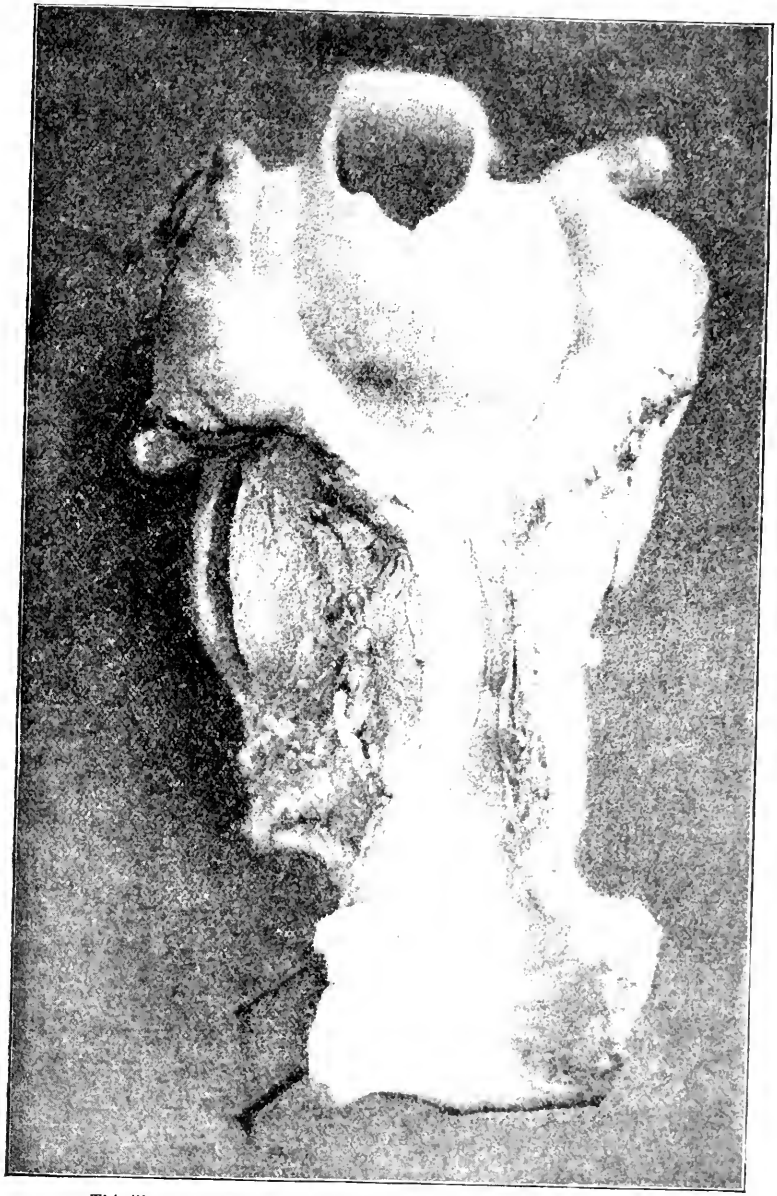
On examination of the œsophagus, the constrictions of the tube, both in extent and location, were found as already described. The opening through the stricture was sufficient only to permit the passage of an ordinary small-sized lead-pencil by using a little force. The circumference of the outer walls of the œsophagus was also found much smaller at this point than at any other portion of the tube, showing that the stricture was not confined to the contraction of the interior of the tube, although the outer contour of the tube was not contracted to the same relative extent as that of the interior of the tube.

On opening the œsophagus by making a longitudinal section through its posterior wall, it was found to be very greatly thickened in the region of the stricture. At the most contracted portion the wall of the œsophagus was from five to six millimetres in diameter, being three times its normal thickness, and gradually becoming thinner toward either end of the stricture. (*Vide* illustration.) On making a section of this tissue, it was so firm to the cut of the knife that I was led to think that it was a scirrhus formation; but, on microscopic examination of this tissue, it was found that the muscular fibrillæ had become degenerated and replaced by a connective-tissue formation.

It was therefore a pseudo-hypertrophy of the muscular wall, or a real hypertrophy of the connective tissue. This tissue formation, however, had been thrown out far in excess of the amount of the muscular tissue that it had replaced.

There was, in addition to this disease of the œsophagus, a moderate enlargement of the thyreoid gland, the left lobe being larger than the right, and involving the recurrent laryngeal nerve on that side, but not pressing upon the œsophagus. Microscopic examination of the gland tissue showed the enlargement to be a chronic interstitial thickening of the connective tissue similar to the condition found in the œsophagus.

In an extended search through medical literature I have been unable to find any case of stricture of the œsophagus reported in which



This illustration is from a photograph taken directly from the specimen.

a thorough examination revealed a condition exactly like this one just reported. The nearest approach to it is the report of those cases of stricture of the œsophagus caused by hyperplasia of the muscular wall. Two of those cases are reported by Poncet,* and one by Ruppert.† The two cases of Poncet occurred in men fifty-nine and fifty-five years old, respectively. Neither was alcoholic or syphilitic, and to no assignable cause could the stricture be attributed. The first patient had, however, suffered an attack of acute articular rheumatism seven months before the commencement of the difficulty in deglutition.

In both cases gastrotomy was performed. The second patient died eight days after the operation, while the first lived four months and died of suppurative parotiditis.

In the first case the post-mortem examination showed the canal of the œsophagus, just above the cardia, to be almost completely obliterated, only admitting a very fine probe; but there was no lesion of the mucous membrane.

The muscular layers appeared to the unassisted eye very much thickened. The constricted portion, examined microscopically, showed some muscular fibers, irregular and quite generally parallel to the direction of the canal, and spreading out into the surrounding connective tissue. At certain points the muscular cells were disposed in small, circular fasciculi, and assumed a very yellow tint.

The peri-œsophageal tissue was found normal. In the second case a post-mortem examination revealed, a short distance above the cardia, a constriction, forming a ring through which could be admitted an ordinary pen-holder. This ring, which was situated under the mucous membrane, appeared red, hard, and fibrous. On making a section, the strictured portion presented a dense surface, homogeneous and similar to that of the preceding case. The microscopic examination of this case was, unhappily, very imperfect. It showed only the absence of all epithelial lesions, and that the nature of the tissue, where the cuts were made, was largely connective tissue.

The case reported by Ruppert was that of a valet who was admitted to the Hospital of the Infant Jesus, Warsaw, Poland, October 24, 1883. In May, 1883, the patient began to have difficulty in swallowing, which had been preceded a short time before by vomiting blood. This greatly

* Sur les rétrécissements de l'œsophage par hyperplasie musculaire. *Bull. méd.*, Paris, 1888, ii, 451.

† Hypertrophy of Muscular Coat, the Result of Chronic Catarrh of the Mucous Membrane. *Gaz. Lek.*, Warszawa, 1884, 2 S., iv, 315.

increased, although at times he could swallow much more readily than at other times, owing, it was believed, to an exacerbation of a catarrhal inflammation of the mucous membrane of the œsophagus. For six years before the appearance of this trouble he had been addicted to the excessive use of alcohol, which was, without doubt, the exciting cause of this catarrhal inflammation. After admission to the hospital, dilatation of the stricture was undertaken and continued with some improvement in swallowing, but the obstruction finally increased to such an extent that he gradually failed and died from inanition on November 27th of the same year.

The œsophagus presented a fusiform dilatation which began two centimetres below the tracheal bifurcation, and ended two centimetres above the cardia with a considerable stricture. The longitude of the dilatation was seven centimetres, and the longitude of the stricture two centimetres. The lumen of the œsophagus in the constricted portion was between two and three centimetres in diameter. The thickness of the walls in the dilated portion was two millimetres, and, in the constricted, seven millimetres. The constricted portion of the œsophagus, when cut, appeared as a thick, compact, unpliable tissue, which had the distinct appearance of being chiefly hyperplasia of the muscular strata. On microscopic examination, the epithelium was absent, and only here and there remnants of the mucous membrane were found in the form of fibrous tissue, with abundant infiltrations of small cells. The submucous membrane appears as a compact connective tissue, which is hyperplastic, abundantly vascular, and has many elastic fibers. There was marked hyperplasia of the muscular coat, especially the muscularis externa, and equally in the circular as well as in the longitudinal fibers. The examination proved the existence of ulceration in the mucous membrane of the œsophagus in the constricted as in the dilated portion, and an almost complete destruction of the mucous membrane, while a very considerable hyperplasia of the muscular strata and of the submucous tissue could readily be detected.

Ruppert, however, does not state whether the hypertrophy is that of the muscular fibers, that is, a real hypertrophy, or hypertrophy of the connective tissue, that is, a pseudo-hypertrophy, as in the case that I have reported.

Albers * refers, in his work, to cases of this form of contraction of the œsophagus which were observed by Rokitansky and Baillie, where the hypertrophied valves of the œsophagus formed a ring which constricted the lumen at its lower part. Zenker and von Ziemssen,† however, believe, from the superficial description of the

* *Atlas der pathologischen Anatomie*, Bd. ii, S. 236.

† *Handbuch der speciellen Pathologie u. Therapie*, Bd. viii, S. 32.

cases, that they were only undiagnosticated carcinoma with hyperplasia of the muscular tissue.

The question of ætiology in these cases is an interesting one. It is difficult to believe that muscular hyperplasia, or a thickening of the connective tissue, is a spontaneous formation; but in these cases, in which we have no history of an irritation, we have no indication as to the exact cause of the formation.

In the case of the man addicted to the use of alcohol, whose case is reported by Ruppert, we have a direct relation of cause and effect between the catarrhal inflammation of the mucous membrane of the œsophagus and the muscular hyperplasia.

The cause of the stricture in the case which I have reported is obscure. This connective-tissue formation is the result, in every instance, of a chronic inflammatory process, and it is analogous to the same formation that takes place in the lung tissue in fibrous phthisis. In this case the chronic inflammatory trouble which caused the difficulty is inexplicable. There was no history of any chronic œsophageal trouble previous to the time when this difficulty in deglutition commenced. There was no ulceration of the interior of the œsophagus at this point, and there was no evidence of chronic inflammation in any other portion of the œsophagus. There was no cicatricial tissue in the stricture, and the mucous membrane was entirely intact. The contraction, therefore, could not have been the result of the action of corrosive substances, and there is no evidence that a foreign body lodged there, causing chronic œsophagitis. It was not a simple stenosis of the gullet, for in that case there would have been no morbid changes in any of its component tissue; and a simple stenosis of the gullet is usually a congenital abnormity. There is a possibility, however, that this stricture might have originated from a congenital narrowing of the tube, and the chronic inflammation might have resulted from the continued irritation of the substances forced through it.

Discussion.

Dr. Langmaid: The paper just read brings up a question of treatment. I would ask if the reader has had any experience with the use of permanent tubes in the œsophagus.

Dr. Roe: I tried that method in this case, but the patient could not endure it. The tube caused strangulation, and, in swallowing, fluids found their way into the larynx, so that she could not retain it.

Dr. Mulhall: Was the rigidity of the crico-arytænoid joints discovered post mortem?

Dr. Roe: It was discovered with the laryngoscope during life, and was confirmed on post-mortem examination. The patient spoke in a monotone; there was no modulation of the voice at all—just as in an ordinary case of paralysis of the posterior crico-arytænoid muscles.

Dr. Mulhall: Was there any paralysis present?

Dr. Roe: Yes; probably from pressure.

Dr. Mulhall: But in addition there was also partial ankylosis. Was the patient iodized?

Dr. Roe: Yes; she had been given iodide of potassium in large quantities before I saw her, but with no effect on the condition of the larynx. There was in this case every evidence that there was paralysis of the larynx. The paralysis of the posterior crico-arytænoids might have taken place first, and the involvement of the tissues surrounding the joints favored the occurrence of ankylosis.

Dr. Mulhall: I have made two post-mortems this year; both were in cases of malignant disease in which pressure was made upon both recurrent laryngeal nerves sufficient to destroy their function. The cords in each case were in the cadaveric position. In neither case was there the least ankylosis of the crico-arytænoid joint, although there had been no motion for some months. That is why I asked the question. Does the author think that the ankylosis was the cause of the appearance he noted in the larynx?

Dr. Roe: No. There was infiltration of other tissues in the larynx which accounted for it.

Dr. Mulhall: The question is of practical interest in this way. We get a case of paralysis of the abductors which has lasted, say, six or nine months, with not much if any motion in the crico-arytænoid joints all this time; it is treated with iodide of potassium, and the patient recovers the voice completely. I can not see why this joint should not regain its original mobility when the original cause of trouble is removed. Why should there be any permanent loss of motion from this cause? I do not understand it, unless there is disease of the articular surfaces.

Dr. Bosworth: There could not be a better illustration of the point I made in my paper yesterday. Here was loss of motion not due to paralysis at all, but to infiltration and ankylosis of the crico-arytænoid joints. The ankylosis occurred in such a position as to produce the appearance of abductor paralysis, with the cords in the median line without paralysis at all. Many would be misled by the appearance and pronounce it a case of paralysis. Some cases of so-called paralysis are not paralysis at all. The observation of pressure upon the recurrent laryngeal nerve is interesting, but it had nothing at all to do with the paralysis.

Dr. Roe: I said that the paralysis might have antedated the ankylosis. I did not assert that it did. Both the nerve-trunks were surrounded by infiltrated tissue.

Dr. Bosworth: There was no evidence of paralysis of both recurrent laryngeals, however. My observation is that when there is pressure upon

the recurrent laryngeal nerve there will be paralysis of the nerve; there will be paralysis of all the muscles supplied by the nerve. I do not accept Semon's statement that certain fibers in the trunk of this small nerve may be paralyzed and others escape. It is a most extraordinary statement. Disease or pressure does not discriminate in this way. Pressure upon the nerve will entirely destroy the function of the nerve, and affect all the fibers passing through it.

Paper.

ON POSTERIOR HYPERTROPHIES OF THE MIDDLE AND INFERIOR TURBINATED BONES.

By HARRISON ALLEN, M. D.

BY the term posterior hypertrophies is meant thickening of the membranes which cover the turbinals as these bones appear at the choanæ. They are more marked on the inferior turbinals than on the middle, and have a disposition to protrude from the nasal chamber into the naso-pharynx. They are, as a rule, very vascular, and in the instance of the inferior hypertrophies are so sensitive to the impression of cocaine that after an application of this agent, a few drops of four-per-cent. solution which is carried to its place from in front by a cotton-armed probe sufficing, they will shrink and be withdrawn from the naso-pharynx. Generally, when the posterior end of the inferior turbinated bone exhibits a disposition to protrude into the naso-pharynx, the anterior end is small, inconspicuous, and rests well above the plane of the floor of the nostril, the entire bone appearing to be set back within the nasal passage. At the same time the free border of the bone, about half way back, is apt either to rest against the floor of the nose, or a small space only can be demonstrated to exist between them.

When the conditions as above described are present, it is well not to interfere (in a surgical sense) with the posterior protrusions, but rather to make astringent or caustic applications to the free inferior border of the inferior turbinated bone, as it is apt to press against the floor of the nasal chamber, or to operate with the object in view of increasing the diameters of the nasal passages by resetting the triangular cartilage and drilling away superfluous projections from the septum. One or more of these plans have been in my hands quite successful in reducing the size of the posterior masses.

Care should be taken not to confound an abnormal condition of the posterior ends of the inferior turbinals with a normal state of the

parts which results from a congenital defect of the vomer which I have ventured to name *recedent*.* It is evident that a vomer which will unite with the floor of the nose at the region of the maxillo-palatine suture can permit the posterior ends of the inferior turbinals to approach, if not to touch, each other. They appear to protrude into the naso-pharynx, when in reality they are retained in the nasal passages, and are in contact simply by reason of the absence of the septum which normally should separate them.

Protrusions of the inferior turbinated bones may exist independently of other conditions, or be associated with hyperplasia of the anterior ends of the middle turbinated bones, or with adenoid growths at the roof of the pharynx. In illustration of the statement last named the following case may be cited:

Case I. *Asthma associated with Posterior Hypertrophy of the Inferior Turbinated Bones; Adenoid Growth and Enlarged Tonsils; Entire Relief of the Symptoms without Treatment of the Posterior Hypertrophy.*—A. B., aged sixteen, reported January 14, 1889, through the courtesy of Dr. John H. Musser. The patient is the survivor of a family of five children, all of whom died in infancy or early childhood. Since the seventh year he has been subject to attacks of asthma. The symptoms were of high grade and were characteristic of being worse in a high wind, especially in the bleak, cold winds of early spring. During an attack he was always more comfortable indoors, and had no desire to seek the open air. The patient has been a mouth-breather since early childhood.

A large obstructive adenoid growth was seen at the vault of the pharynx. The tonsils were of great size, hypertrophied, and projecting. The roof of the mouth was high, arched, and narrow. The anterior end of the inferior turbinated bone was the seat of a large fibrous induration which was scarcely at all affected by cocaine. Both posterior ends of the inferior turbinal were greatly enlarged and projected into the naso-pharynx. The circulation was impaired, the heart excited, the hands and feet cold.

The treatment was continued through the months of May and June, and consisted in ablation of the adenoid growth, excision of the tonsils, and the removal by the snare of the anterior ends of the inferior turbinated bone. Nothing occurred to interrupt the treatment, which was completed early in the summer. The patient reported September, 1889, with the statement that the mouth-breathing had disappeared, the disposition to asthmatic attacks had entirely ceased, and the general condition of the patient was very greatly improved, while little or no change had taken place in the size or appearance of the posterior hypertrophies.

* Toner Lecture, Washington, 1889.

Remarks.—This case illustrates, first, the improvement of the general circulation by removal of the adenoid growths from the pharynx and establishing nasal respiration. Secondly, the dependence of an asthmatic condition upon the presence of adenoid masses and enlarged tonsils; thirdly, the independence of the posterior hypertrophy of the inferior turbinated bones of any of the exciting causes of distress.

Case II. *Recurrent Attacks of Asthma in an Adult, associated with Posterior Hypertrophy of the Inferior Turbinals; a Cure effected without Treatment of the Last-named Condition.*—C. D., aged forty, reported September 30, 1889. He had in childhood attacks of asthma. During adolescence these ceased. They again announced themselves about the twenty-sixth year. After a well-defined series of attacks at this time the patient again remained free from them until the forty-second year. At this time the asthmatic attacks were of increased severity and accompanied with acute catarrhal symptoms. The left nasal passage was the smaller throughout. The anterior ends of both middle turbinated bones were in a state of hyperplasia. The anterior ends of the inferior turbinals were smaller than usual and displayed no evidence of hypertrophy. The posterior ends of the inferior turbinals were enormous and firmly in contact with each other in the naso-pharynx. The patient had been advised by a practitioner to have these posterior growths removed, but, remembering the facts in the case of A. B., I stated to the patient that it was not always necessary to remove such swellings; at least, that I would propose treating first the other abnormal conditions of the nasal chambers. I need not detail the treatment in this case, which did not differ from that of other cases of chronic nasal catarrh, other than to state that the symptoms of catarrh and of the asthma had gradually disappeared, and at the time of this writing the patient is in all essential features cured. Nothing has ever been done to the posterior swellings. Indeed, they have in great part disappeared, and at different times, when I have examined the parts, I found both ends of the inferior turbinated bones in a perfectly normal condition, and at other times they protruded from the nasal chambers. The patient is never aware when the swellings may be found projecting into the naso-pharynx. He is an intelligent man, interested in his case, and I have every reason to believe that any sensation that could be associated with the states of the turbinals lying within the naso-pharynx would be promptly reported

Remarks.—In this instance posterior swellings of the inferior turbinal appeared to be quite inactive in the production of the catarrhal or asthmatic symptoms.

In a third case, asthmatic in character, many complications existed, but amid them all it was evident to my mind that the pos-

terior hypertrophies of the middle turbinals did not require active treatment.

Case III. *Asthma and Chronic Bronchitis in a Woman past Middle Life, associated with Myxomatous Polypi and Engorgements of the Posterior Ends of the Middle Turbinated Bones; Disappearance of all the Symptoms without Treatment of the Posterior Hypertrophies.*—Miss E. F., aged fifty-five, reported October 10, 1889. She has been subject from childhood to attacks of headache accompanied with nausea. Seven years ago she contracted a severe coryza, which was accompanied with paroxysms of sneezing, and since that time she has been liable to take cold from slight causes. Five years ago an asthmatic bronchial cough with imperfect respiration was developed. Tinnitus has been complained of for the last three months.

On examination, a number of large myxomatous polypi were seen in the nasal passages. The naso-pharynx showed the inferior turbinated bones to be normal, but the middle turbinated bones on both sides—more especially on the left—were greatly thickened, and occupied entirely the upper third of the choanæ. I at once proceeded to remove the polyps by the snare and the forceps, a treatment which was completed by December 19th. At this time the following report was made: Nasal respiration entirely established; disposition to "take cold" and to sneeze entirely checked, while the cough and asthmatic attacks remained unchanged. The watch test showed the hearing distance of the right ear to be eighteen inches. Inflation of the ear produced injection of Shrapnel's membrane, but the long handle of the malleus was not retracted.

I now began a treatment for the reduction of the swellings of the posterior ends of the middle turbinated bones. This was accomplished with great difficulty, for the parts proved to be very painful. Carefully conducted applications of astringents and the galvano-cautery were continued until February 19th, but very little or no improvement was discernible in their appearance; and the condition of the bronchial tubes remained unchanged. The hearing distance gradually increased, however, and by January 17, 1890, it reached thirty-two inches by the watch test.

On February 19th the local treatment was stopped. The patient left for a visit to her home in the country, and I did not hear from her until March 13th, when I received a letter in which she stated that an attack of otitis media developed in the right ear on March 6th, and appeared to have been in no way remarkable as an attack of catarrhal inflammation of the middle ear ending in suppuration and discharge of the contents of the middle ear into the external meatus. The patient again called at my office on April 10th, with the report that she appeared to be entirely well. There was no bronchitis or asthma. The hearing distance remained at thirty-two inches. Examination of the naso-pharynx showed entire disappearance of the infiltrations which were present when first studied.

Remarks.—This is an interesting case in many respects. The first point to which attention is directed is that in a woman, fifty-five years of age, a disposition to formation of myxomatous masses is abruptly developed, extensive infiltrations occurring at the posterior ends of the middle turbinals of both sides in addition to the polypi at the anterior ends, which disposition was especially marked on the left side; that is to say, the morbid processes, which at the anterior part of the middle turbinated bones developed myxomatous polypi, had excited a chronic inflammation at the posterior part. In this extensive seat of diseased action the inferior turbinals remained normal. As secondary effects to the conditions of the middle turbinals were developed bronchitis with asthmatic complications, and a low grade of aural catarrh. The removal of the myxomatous masses did not relieve the bronchial conditions, while it controlled, but did not cure, the aural catarrh.

Now, since the myxomatous tumors were entirely removed, it is fair to suppose that the persistent complications in the lung and in the aural passages were maintained by the chronic inflammation at the posterior parts of the middle turbinals. The case slowly improved under the tedious treatment of the reduction of such infiltrations. It appeared to be permanently lifted by a crisis spontaneously occurring in the form of an acute inflammation ending in suppuration in the right tympanic cavity. This incident was of more than special interest; for, if it had occurred at the time that local applications were being made, it might have been referred, with justice, to the effects of the local treatment; but, fortunately for the sequence of the events, it took place spontaneously when the patient was not under treatment but resting quietly at her home. After the subsidence of the otitis media the thoracic conditions disappeared.

In a fourth case chronic inflammation of the posterior end of the middle turbinate appeared to be an inconsequent association with chronic recurrent polypus of the anterior portions of the same bones.

Case IV. *Recurrent Chronic Inflammation, with Myxomatous Polypi in an Adult, with a Gouty History; Chronic Infiltrations of the Posterior Ends of the Middle Turbinated Bones, which remained Unrelieved and yet appeared to have no Effect upon the General Condition.*—Mrs. G. H., aged forty, of a nervous temperament, reported November 6, 1880. The father of the patient suffered from gout, and the grandfather died from an attack of gout of the stomach, but the patient herself had never been attacked with acute gout nor have her physicians suspected it in her system. In her twentieth year she had an otitis media in both ears, which

ended in suppuration; there was at that time no deafness. There was a history of "hay fever," which developed in May and was always worse in the warm, damp weather. On one occasion during the course of the treatment she reported what she described to be an attack of hay fever in December, but which appeared to be in no way different from an attack of acute coryza with excessive lacrymation. Difficulty in breathing through the nostrils and a copious anterior mucoid discharge of five years' duration were the chief distresses for which she sought relief. The conditions were frequently accompanied with attacks of migraine-like headaches.

Examination of the nasal passages from in front showed the presence of numerous small pedunculated tumors on the anterior portion of the middle turbinated bones. The inferior turbinals were normal. There was no deflection of the septum. The polyp masses were not large, and none of them came down below the level of the upper border of the inferior turbinals. Both middle turbinated bones were set far back in the nasal chamber. The choanæ were small, oval, and of the embryonic type. They exhibited on the upper portion of both sides a grayish-yellow mass, which filled up the upper third of the plane of the opening.

The patient remained under my care for six weeks, during which time the polyps were removed by the snare and galvano-cautery; but the greatest care had to be exercised in the treatment, no matter by what means conducted. The growths were excessively hard and vascular. Attempts at their reduction or removal not only produced great pain at the time, but were apt to be followed by inflammatory reaction or attacks of migraine. The treatment, however, proved satisfactory, and the patient was entirely relieved of her distresses. It will be tedious to narrate all the circumstances in this interesting case, and I may briefly state that in 1882, 1885, 1888, and 1889 she reported for treatments, which averaged about one month each, for removal of recurrent growths. They thus reproduced themselves at intervals respectively of two years, three years, and one year. The swelling at the posterior ends of each middle turbinated bone was reduced by the same means as were employed for the reduction of the anterior growths, but the difficulty of conducting local treatments seemed to be in a direct ratio as one advanced from the anterior to the posterior ends of the bones.

Remarks.—It is my opinion that a gouty element entered largely into this case, the treatment of which was conducted with great difficulty. I have always found that gouty subjects do not respond kindly to surgical interferences. It also would appear that the case is a typical expression of recurrent inflammatory nasal polyp, apparently of a myxomatous type, yet which never became of large size. Finally, the reflection has to be made that it is probable that in gouty subjects ordinary phases of acute irritation are especially

liable to assume the hay-fever-like type and to be associated with headache. It is important to remember that in a history similar to the one above given the prognosis should be especially guarded.

In a fifth case posterior hypertrophies of the inferior turbinals persisted after a catarrh which was dependent on anterior hypertrophies had been cured.

CASE V.—*Hyperplasia of the Anterior Ends of the Middle and Inferior Turbinals in an Adolescent, accompanied with Posterior Hypertrophy of the Inferior Turbinals; a Cure of the Catarrhal Symptoms secured without Reduction of the Posterior Masses.*—I. J., aged eighteen years, reported October 1, 1887. He had suffered from chronic nasal catarrh for fourteen years. He was of slight frame, tall, and had large, bluish hands and an excitable heart. The patient was of strumous disposition. From early childhood he was a habitual mouth-breather. He complained of anterior and posterior mucoid discharge. He was fond of athletic sports, could run and skate as well as any of his companions, and was an expert at base-ball.

Upon examination, both inferior turbinals were found to be hypertrophied. The septum was deviated to the right at the premaxillary portion, but elsewhere was moderately straight. The anterior ends of both middle turbinated bones participated in the general hypertrophy of the mucous structures. Examination of the pharynx showed the posterior ends of the inferior turbinals projecting from the nasal chamber into the naso-pharynx. The round, large, grayish-yellow masses were there seen touching each other along their free median borders. The roof of the mouth was narrow and high, and the epiglottis was markedly compressed laterally.

The treatment in this case was very protracted, owing to the excitable state of the patient. This was in great measure due to the state of the system incident to the habit of mouth-breathing and to faulty domestic discipline. With exercise of great patience, applications could be made to the hypertrophied conditions of the nostrils, but the patient resisted any attempt to treat the posterior masses. A proposition to the parents to etherize the patient and remove them in a single sitting by the snare was not accepted. The result was that the posterior hypertrophies were never treated. Notwithstanding this, I was agreeably surprised to find the symptoms of the catarrhal state gradually abating, and by May 19, 1888, they had in great part disappeared. Indeed, the unrelieved symptoms might readily be attributed to the faulty shape of the parts and to the diathetic tendency. I have kept up a knowledge of this patient's condition, and have seen him at intervals from two to three times a year. A gradual improvement is acknowledged, and at the date of this writing he remains entirely well.

Remarks.—In this case posterior hypertrophies of the inferior turbinals were present in a strumous subject suffering from an ex-

cited heart, impaired circulation, and nasal hypertrophy, the result of prolonged mouth-breathing. The habit last named had not interfered with physical exercise. The catarrhal symptoms were gradually removed by treatment of the anterior ends of the middle and inferior turbinated bones. It would appear that the posterior hypertrophies were non-essential factors in the case.

CASE VI.—*Ulceration of the Triangular Cartilage, with Epistaxis, in a Young Adult in whom one of the Inferior Turbinated Bones was hypertrophied posteriorly; no Symptoms attending the Last-named Condition acknowledged.*—Miss K. L., aged twenty-three years, reported, February 7, 1889, with a large ulceration on the left side of the triangular cartilage. This was exciting a constant disposition to hæmorrhage and irritation about the front of the nasal chambers. There were no catarrhal symptoms other than those which might be attributed to the presence of the ulcer.

Upon examination of the naso-pharynx, I found that the right inferior turbinal was much swollen, occupying nearly all of the nasal space and projecting into the naso-pharynx. There was no complaint of posterior discharge or of irritation of the pharynx.

The patient remained under my care until the early part of the summer, at which time the ulceration was entirely healed. The patient recovered from the condition for which she reported. There was no change in the condition of the posterior hypertrophy, and so long as it was not complained of I did not interfere with it. The patient again reported on April 30, 1890, for a slight catarrhal irritation, which was found to be dependent upon the inflamed state of the anterior end of the right middle turbinated bone. I was interested in noting that the posterior swelling was no longer present.

Remarks.—In this instance a septal ulceration existed, together with posterior hypertrophy of the opposite side. The treatment of the septal ulceration was completed without any change being made in the size of the hypertrophy. At the end of a year's absence from observation the patient reported with a mild form of nasal catarrh, which was localized on the right side. Examination showed that the right posterior hypertrophy had entirely disappeared.

CASE VII.—*Chronic Nasal Catarrh of an Obstructive Type, due to Narrowing of the Left Nasal Chamber, and accompanied with Protrusion of the Posterior End of the Left Inferior Turbinated Bone into the Naso-pharynx; Removal of the Mass last named, with Unsatisfactory Result; Operation for Enlargement of the Left Nasal Chamber, with Cure of all the Symptoms.*—Mr. L. M., lawyer, aged forty-five, reported, January 9, 1888, with a history of dropping of mucus from the nose into the throat of many years' duration. He was subject to paroxysms of sneezing, and

had acquired the habit of constantly clearing the throat. Alternations of nasal obstruction were very marked—both nasal chambers never being entirely open. For several months past he has complained of symptoms of neurasthenia, with occipital headaches and flatulency. The patient is an active, hard-working attorney, and had been very much annoyed of late years by subjective odors, recalling asphalt or creasote. These were worse in damp than in dry weather.

Upon examination, great asymmetry of the choanæ was found, the left being the smaller. The posterior ends of the turbinals on both sides were enlarged, the inferior turbinals of the left side distinctly projecting into the naso-pharynx. Anteriorly, the nasal chamber was narrowed on the left side, the septum being markedly deflected to the left.

A long course of treatment, consisting of sprays, detergent gargles, and the use of tonics, had not materially improved the condition of the patient. Being impressed with the appearances of the left lower turbinal, I resolved to remove the redundant tissue of the posterior end by the snare. This was accordingly done May 16, 1888. Immediately following this procedure considerable improvement was acknowledged, and on October 18th, after a summer vacation, he reported with the statement that the dropping had ceased, the paroxysms of sneezing were fewer and less severe, and the clearing of the throat better.

Thus, after a period extending from January 9th to October 18th (the treatment consisting in the use of detergent washes, gargles, etc., and of the reduction of the posterior ends of the left turbinal by the snare), I had succeeded in ameliorating most of the symptoms and in eliminating one—namely, the fall of mucus from the nose into the throat. The patient disappeared from observation soon after this time. He subsequently placed himself in the hands of a homœopathic physician, where he remained until May 7, 1890, when he again reported with the conditions but little improved from his first complaint. I then informed him that in my judgment it would be useless to go over the ground which we had previously covered—viz., snaring the posterior hypertrophies (which had by this time returned)—and I advised him to submit to an operation under ether. I intended, if the procedure were accepted, to straighten the septum so far as was practicable, to explore the chambers, and to determine their condition by digital examination. This was accordingly done on April 17th. I performed my usual operation of separating the inferior border of the triangular cartilage by the aid of drills and saws, and pushing it to the right. The osseous portion of the septum tending to occlude the chamber was removed and a Roberts' pin was employed to fix the membranous portion of the septum in a position more to the right. By passing my little finger well into the chamber along the middle turbinals I removed from its free anterior border a quantity of redundant tissue, and separated the anterior third of the bone from the outer wall of the nose to which it had been held by numerous bands—the products of inflammation. The patient did very well after the operation and reported

in my office on April 28th. The series of treatment initiated for the removal of the irregular nodules created by the drills and saws employed at the time of the operation was completed by May 17th. He reported himself entirely comfortable, and absolutely relieved of all his sensations, and remains so at the date of this writing.

Conclusions.—It is clear to my mind that it is not always necessary to remove posterior hypertrophies. It is a good rule to leave them until all other morbid conditions have been carefully treated, when, indeed, it may be found, as in Cases II, V, and VI, that it is not required to treat them at all. Case VII shows that they had been prematurely removed with only temporary benefit. The posterior hypertrophy of the middle turbinals is of a distinct significance from that of the inferior. It is commonly associated with myxomata of the anterior third of the bone. The enlargement is never anginose, and requires simply local treatment to reduce the chronic inflammatory thickening, but in some instances it is very difficult to remove it.

Presentation of Instruments.

A "LINGUAL" AMYGDALOTOME, OR AN INSTRUMENT FOR REMOVING GLANDULAR HYPERTROPHY AT THE BASE OF THE TONGUE.

By JOHN O. ROE, M. D.

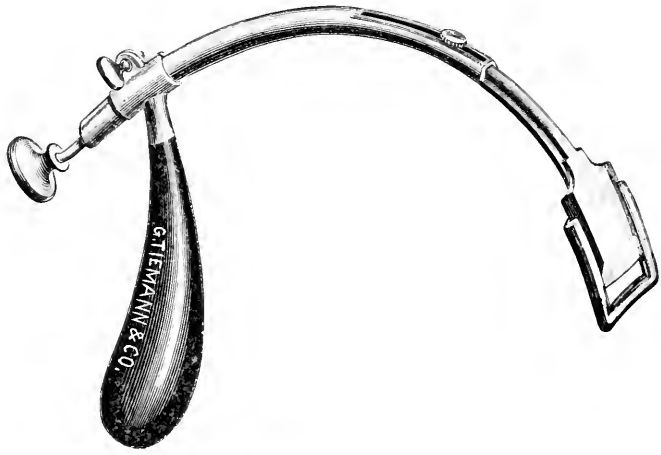
The accompanying illustration represents the instrument. It is constructed on the principle of Physick's amygdalotome. The shank of the instrument, as shown in the cut, is curved so as to pass over the dorsum of the tongue, and the fenestra in the cutting portion of the instrument is made sufficiently wide to grasp the mass of tissue which is usually more or less spread out across the base of the tongue just above the epiglottis.

The handle is attached to the shaft of the instrument by a clamp which permits it to be adjusted to any position by being moved forward or backward, or turned to either side. The instrument is more conveniently used with the handle turned to one side, and it may be used with equal facility by either hand.

The methods commonly adopted for the removal of glandular hypertrophy at the base of the tongue are the galvanic cautery and the snare. But these methods are far inferior to removal by a cutting operation, similar to that which is employed in the removal of hypertrophied faucial tonsils. The faucial tonsil and this so-called "lingual" tonsil are composed of tissues of similar structure. Therefore the method which has already been found best suited for the removal of one may be regarded as best adapted to the removal of the other. It is only in cases where there are also enlarged vessels to be destroyed that the galvanic cautery is superior to any other method.

This instrument will be found superior to the snare for the reason that the

tissue can be much more readily engaged in the fenestra than in the loop of the snare; and this is especially true if the instrument is pressed down firmly over the tissue, so as to make the glandular mass protrude through the opening as far as possible before the blade is forced down.



The instrument, which has been made for me by Tiemann & Co., of New York, is constructed so as to work as easily and freely as a faucial amygdalotome, and the blade is very readily taken out for cleaning and sharpening by simply removing the screw that fastens the blade to the stem.

In using this instrument, the tongue should be drawn forward and held by the patient (by the right hand if the operator uses the instrument with his right hand, and *vice versa*), and the laryngoscopic mirror should be employed, for the reason that without due care the upper portion of the epiglottis might be engaged in the fenestra and removed instead of the hypertrophied tissue of the base of the tongue, and for this reason it is not a safe instrument to be used by an inexperienced operator.

A FLEXIBLE CURETTE.

By EDGAR HOLDEN, M. D.

This instrument is shaped at the tip like the finger-nail, which by its elasticity adapts itself to the pharyngeal vault and can be rapidly used, even on a rebellious

child, without the aid of an anæsthetic. It has been found to be applicable to the majority of cases, especially of the fimbriated and cushion-like varieties.

INSTRUMENTS FOR CURETTING THE PHARYNX.

By D. BRYSON DELAVAN, M. D.

These instruments were of different shapes. One was loop-shaped, not flexible, the other a sharp spoon; each being used to enucleate growths prior to removal with forceps.

BUSINESS MEETINGS.

The Twelfth Annual Congress of the American Laryngological Association was opened at ten o'clock on the morning of Thursday, May 29, 1890, the President, Dr. J. N. Mackenzie, of Baltimore, being in the chair.

The following Fellows responded to roll-call, or were present during the meeting:

John N. Mackenzie, Baltimore, President.
Edgar Holden, Newark, First Vice-President.
Charles H. Knight, New York, Secretary and Treasurer.
D. Bryson Delavan, New York, Member of Council.
M. J. Asch, New York.
F. H. Bosworth, New York.
W. H. Daly, Pittsburg.
F. Donaldson, Baltimore.
J. H. Hartman, Baltimore.
F. W. Hinkel, Buffalo.
E. F. Ingals, Chicago.
W. C. Jarvis, New York.
S. W. Langmaid, Boston.
A. W. MacCoy, Philadelphia.
H. C. McSherry, Baltimore.
J. C. Mulhall, St. Louis.
C. C. Rice, New York.
J. O. Roe, Rochester.
C. Seiler, Philadelphia.
H. L. Swain, New Haven.
S. O. Vander Poel, New York.
B. F. Westbrook, Brooklyn.

Among the guests of the Association were Drs. J. A. Stewart, W. D. Booker, C. C. Shippen, Dixon, and Hurd, of Baltimore, and Dr. T. Morris Murray, of Washington.

The delivery of the President's address by Dr. J. N. Mackenzie was followed by the reading of papers.

In executive session, at the conclusion of the morning programme, Dr. Jonathan Wright, of Brooklyn, N. Y., was, on recommendation of the

Council, elected an active Fellow of the Association. His thesis was entitled Salol in Acute Tonsillitis and Pharyngitis.

The President appointed the following committees:

Nominating Committee.—Dr. S. W. Langmaid, Dr. E. F. Ingals, Dr. F. W. Hinkel.

Auditing Committee.—Dr. F. W. Hinkel, Dr. H. L. Swain.

At a business meeting on the morning of the second day, the minutes of the last meeting of the Association, together with those of the Council for 1889–'90, were read and approved.

Secretary's Report.—The Secretary presented the volume of *Transactions for 1889.*

Of the active Fellows, Dr. Frank Donaldson, Jr., of Baltimore, has resigned since the last meeting, and Dr. J. H. Douglas, of New York, has been dropped by vote of the Council. The death of R. Voltolini, of Breslau, corresponding Fellow, was announced.

The arrangement of last year for the publication of the *Transactions* has been renewed, and members are requested to bear in mind that papers are not to be elsewhere published.

Treasurer's Report.

THE AMERICAN LARYNGOLOGICAL ASSOCIATION, MAY 28, 1890.

In Account with Charles H. Knight, Treasurer.

Receipts.		
By balance, 1889, account	$680 08	
Back dues	20 00	
Dues, 1889–'90 (42)	420 00	
Sale of *Transactions*, 1888	41 00	
Sale of *Transactions*, 1889	32 25	
Discussions, *N. Y. Med. Jour.*	43 42	
Electrotypes, Vol. X	6 44	
		$1,243 19
Expenses.		
Stenographer, 1889	$75 00	
Programmes, etc., 1889	43 50	
Programmes, etc., 1890	34 50	
Trans. Congr. Am. Phys. and Surg.	132 30	
Transactions, 1888 (Trow)	484 45	
Transactions, 1889 (Appleton)	271 36	
Stationery, printing, postage, etc.	47 50	
		$1,088 61
Balance, May 28, 1890		$154 58

F. W. HINKEL,
H. L. SWAIN,
Auditing Committee.

Report of the Librarian, 1890.

Since the last meeting of the Association, 1 book and 9 pamphlets have been presented to the library.

The library now contains 59 bound and unbound books and 908 pamphlets.

Respectfully submitted,

THOMAS R. FRENCH, *Librarian.*

The *Nominating Committee* reported as follows:

President.—Dr. W. C. GLASGOW, St. Louis.

First Vice-President.—Dr. J. O. ROE, Rochester.

Second Vice-President.—Dr. J. H. HARTMAN, Baltimore.

Secretary and Treasurer.—Dr. C. H. Knight, New York.

Librarian.—Dr. T. R. FRENCH, Brooklyn.

Member of Council.—Dr. HARRISON ALLEN, Philadelphia.

Dr. S. W. LANGMAID.

[Signed] Dr. E. F. INGALS,

Dr. F. W. HINKEL,

Committee on Nominations.

The amendment to the Constitution proposed by Dr. Daly at the last Congress of the Association, as follows: *Resolved*, That Section 3, Article V, of the Constitution be altered to read: "The nomination and election of officers shall take place by ballot on the last day of the meeting," then came up for consideration. After prolonged discussion it was put to vote, and, not receiving the required three-fourths vote, was declared lost.

Dr. DALY gave notice of his intention to propose an amendment to the Constitution as follows: "Candidates for membership shall present a thesis, shall be recommended by three members, and shall be balloted for at the first executive session of the meeting, the names of all candidates to be sent to the members with the notices of the annual meeting, and that Sections 4 and 6, Article III, of the Constitution, be annulled."

Dr. F. DONALDSON gave notice of a proposed amendment to the Constitution, as follows: Section 2, Article III, to read: "The Fellows shall not exceed seventy-five in number."

Dr. INGALS gave notice of a proposed amendment to the By-laws, as follows: "Notice of any important business to come before the Council shall be sent to each member of the Council two weeks before the meeting, and any member unable to be present may send in his vote by mail on any question relating to membership or place or time of meeting."

Dr. BOSWORTH moved that the Secretary, in his next communication to the members of the Association, request them to send to him a written list of their various publications, arranged in chronological order, with the time and place of publication of each, and that he place these lists on file in the archives of the Association. Carried.

On motion of Dr. INGALS, it was voted that the Council be requested to drop from the list of membership the names of those members who have not complied with the rules of the Association.

At the close of the programme on the third day the Society went into executive session, and, election of officers being declared in order, the Secretary was, on motion of Dr. Bosworth, instructed to cast the ballot for the ticket proposed by the nominating committee.

On motion of Dr. Bosworth, seconded by Dr. Hinkel, it was voted to reconsider the action taken by the Association, on the second day of the meeting, on the amendment to the Constitution proposed by Dr. Daly, to the effect that "the nomination and election of officers shall take place by ballot on the last day of the meeting." The amendment, being thus again brought to a vote, was declared carried. Dr. Delavan and Dr. Langmaid requested that they be put on record as voting in the negative. Dr. Delavan entered a formal protest against the reversal of the action taken at a full meeting of the Association at the regular business session held upon the morning of the second day: 1st, because, according to Section 2, Article IV, of the By-laws of the Association, "all miscellaneous business (shall) be transacted" at "the Business Meeting," which "shall be held during the first hour of the second morning session"; 2d. because "unanimous consent," as required by the By-laws, Section 3, Article IV, had not been given, and, moreover, a vote to suspend the By-laws, as provided for in Article VIII, had not in the present instance been taken, so that the action of the meeting was clearly illegal; 3d, because the number present at the reversal of the motion was a bare quorum which did not represent the already expressed sentiment of the Society at large.

Dr. DELAVAN gave notice of his intention to bring up the following resolution at the next Congress of the Association: "*Resolved*, That the amendment of Dr. Daly relating to the election of officers, passed at the meeting of 1890, be reconsidered."

Dr. DALY gave notice of a proposed amendment to Section 3, Article V, of the Constitution as follows: "The nominations for officers shall be made in executive session on the first day, and the ballot for them shall take place on the last day of the meeting."

On motion of Dr. INGALS, a vote of thanks was passed to the officers of the Association for their efficient provision for this meeting, to the good people and profession of Baltimore for their courtesy, and to the management of the Johns Hopkins Hospital for the hospitality which they have extended to us.

There being no further business, the Congress was declared adjourned.

OBITUARY.

Dr. Hosmer Allen Johnson died of pneumonia, at his home in Chicago, on February 26, 1891, aged sixty-eight years, four months, and twenty days.

Dr. Johnson was one of the original members of the American Laryngological Association and was elected first vice-president in 1885. His contributions to laryngology were valuable but not numerous, and he was not a frequent attendant at the meetings of the association. It will be remembered that his last appearance with us was at the Congress held in Washington in 1888. In spite of rather frail health, he was remarkable for his professional activity, and he filled many public positions of honor and importance. It is interesting to notice that he began his career under the most adverse circumstances. His education was frequently interrupted by ill health and lack of means, but he finally graduated from Rush College, Chicago, in 1852, at the head of his class. He was then in his twenty-eighth year, and entered upon professional life with unusual promise, which was more than fulfilled.

At three of the meetings of this association he presented papers as follows: In 1883, Reports of Five Cases of Congenital Tumor of the Larynx; in 1885, Paralysis of the Larynx, with Reports of Thirty-two Cases; in 1887, Cancer of the Larynx. These papers may be found in our Transactions, and other writings of his on various medical subjects are in existence.

The efficient service which he rendered in connection with the work of the Sanitary Commission during the Civil War and with that of the Relief and Aid Society at the time of the great fire in Chicago should not be forgotten.

He was a man of striking personal appearance, of high culture, and possessed an amiable disposition which endeared him to all with whom he came in contact. No more fitting close can be made to this brief notice of a busy life crowned with success than the words of one of his intimate friends: "Benevolent, magnanimous, cultured, brave, strong, good—all these adjectives belong to him in the fullest sense. He was a firm believer in the philosophy of Marcus Aurelius, that the highest good is found in doing good to others."

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